

The Commercial Car Journal

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Activities in a Big Trucking Business



Buffalo Firm Specializes in Emergency Work, Rather Than Straight Hauling, Such as Bringing in Stalled or Wrecked Cars

By R. E. DOWNER

THE J. F. Kulp & Sons Co., of Buffalo, N. Y., truckers and erectors, is doing work all the time that once went largely to the railroads, and during one of the most severe snow storms of recent years actually relieved railroad trains of burdens which the trains had already assumed. This storm occurred in the early part of last December. It tied up the street railway, crippled delivery systems, and choked the switches in the railroad yards. So it did not surprise the Kulp people when they were asked to furnish several trucks to carry mail from stalled railroad trains to the city postoffice.

It was the Pennsylvania railroad that needed this assistance. The Pennsylvania is one of several roads that use the New York Central Station, but during and shortly after the storm it was one of the lines that could not get its trains in or out of the station. Outbound trains were not dispatched. Inbound trains were forced to come to a stop more than three miles from the station. The order to come for the mail was received about 10 p. m. Two 5-ton Pierce-Arrow trucks reported at the New York Central Station, as directed, and from there were sent to the yards in the eastern part of the city.

The tired mail clerks welcomed the relief and unloaded the pouches and sacks into the waiting trucks, and then rode in with the mail to the postoffice in the central part of the city. The trucks got through the snow with no trouble.

The Kulp company maintains a day and night service. Many of its employees live within five minutes' walk of the office and have telephones. When a call is received, the person calling in is asked certain questions, from the replies to which it is determined what sort of equipment is to be sent on this job. The men needed are then summoned by telephone, the truck selected is run out into the street, and lights are turned on, so that when the driver and other men arrive they can start at once.

In the December storm referred to the men worked day and night from Saturday to Monday, the principal business being that of bringing in stalled cars. The firm has a fleet of 13 trucks, all but one of which are Pierce-Arrows, and it has a score of heavy horses also. The trucks managed to rescue most of the stalled cars to whose assistance they were summoned, but teams were sent where the streets were narrow or the going bad.

Until the first of January, when it was increased 50 cents, the ordinary charge for

a truck and crew was \$2.50 an hour, but during the storm, because of the extra wear and tear on the trucks and the imminent possibility of breaking some of the mechanism, the charge was doubled. Even at this rate, however, the trucking people had several requests to handle the regular deliveries for firms that were tied up. One such request came from a merchant whose 60 electric delivery cars were out in the snow. The truckers rescued all these cars and brought them in, but declined the requests to take over the regular delivery of firms in business.

One man had to be brought in five times during and shortly after this storm. This man had formerly worked for the Kulp's, but last fall started in business for himself with a single truck. He had a good business, but the storm would have knocked him out if he had not received timely help. There is plenty of trucking to be done, say the Kulp's, who have done more this last fall and winter than in any previous year at the same seasons.

During the winter a common automobile mishap is getting stuck in the snow. At other times the usual accidents are turning



Two Riggers' Poles, One of Them Eighty Feet Long, Loaded on One of Kulp's Trucks for a Forty-Mile Trip to a Tank-Hoisting Job

To ship by railroad, if cars could have been obtained, would have required two flat cars. Canvas marked with firm name covers erecting apparatus. Extra wheels seen are for maneuvering poles into place at destination

over, losing wheels, or running over a bank or into the canal. If the nature of the accident, as indicated by the man who telephones in to the Kulp office, is unusual, a man is sent to inspect the wreck and telephone in what equipment is needed for the salvage. Each truck is always equipped with tackle, jacks, wooden sawhorses, rollers, running planks, crowbars, wire cable and rope of various sizes. If the wrecked car has lost one or both fore wheels, it is towed in forward; if it has lost one or both rear wheels, it is towed in backward, the steering gear being fastened securely so that the wreck will tow straight; if front and rear wheels are lost, or more serious damage done, the car is loaded bodily upon a truck and carried in.

When a car goes over a bank or into the water, a timber or steel pole designed for the purpose is set on end and held in position by guy ropes. A cable that runs through tackle at the tip of the pole is made fast to the wreck and the damaged car is loaded upon a truck.

The firm has both steel and timber poles for use according to the weight to be raised. It puts safes into tenth-floor offices, builds steel smokestacks section by section, places giant cranes in position, and raises iron tanks to the roofs of buildings.

One job in which tanks were concerned was handled by the company a few days ago. The tanks were manufactured in Buffalo and were to be erected on a building at Newfane, about 40 miles distant. The Kulp's sent their 80-ft. erecting poles on a single truck at 9 o'clock in the morning, reached Newfane at noon, placed the tanks, and returned to Buffalo that night.

The Kulp's have the contract to keep the road from the Buffalo city line to Lockport open for auto traffic this winter, and are using in the work a snow plow owned by the Buffalo Automobile Club. A 5-ton

Pierce-Arrow truck is attached to the plow and pushes it. A driver and one helper are in charge of the work. Keeping informed as to conditions on the road and whether or not to use the plow from day to day is part of the contract.

The firm has other contracts of a type infrequently encountered in business. These are for trucking for certain manufacturers engaged in the production of war materials. These manufacturers want the trucks the minute they want them, and to be certain that they can have them they order them for 7 a. m. when they will not have any use for them until 11 o'clock or noon, and then only a short haul to the railroad or to a plant where another part

of the mechanism is being produced, after which the truck is retained for possible use in the afternoon. Or the manufacturer which the truck is retained for possible another plant will send a big truck for it long before it will be ready, thus being sure of having the truck when he wants it and perhaps hurrying production at the other plant, for when a truck is waiting for its load the men producing the load are usually willing to speed up a bit.

The Kulp company makes an entry in triplicate for every order, the record on a yellow form being the original, on blue the checking copy, and on white for the driver. One of these forms, recording an order to bring in a wrecked car and showing the



Kulp Crew Recovering a Passenger Automobile That Had Fallen Into the Canal

time required and garage's receipt, is typical of the work done during the snow-storm.

Another record is kept in a book, this book system of recording jobs having been developed by the Kulp people themselves to meet their own needs. When an order is received, say in the late afternoon, for a job to be done the first thing in the morning, the name of the person or firm for whom the job is to be done is written across the page. The name of the foreman to take charge of the job is written in blue at the left side of the page and the names of his helpers in black lead. A name in red pencil indicates the man who is to drive the truck, or, if there is a capital T in black pencil after his name, to drive a team.

When the foreman reports in the morning he receives directions in regard to the job, and his time and the time of his helpers and the driver are set down before their names. If one man does not show up, his name is crossed off and the name

DRIVER OR FOREMAN MUST HAVE THIS ORDER SIGNED AND RETURNED TO OFFICE		
J. F. KULP & SONS CO.		
Your Order No.	38	Pro. No.
Mr.	H. F. Brierley	Our Order No.
Carting	Wrecked touring car	Date, Jan. 9 1918
From	Kensington and East Delavan	
To	Ellicott garage	
Both front wheels off. Car towed in.		
Received in good condition		
By	Ellicott Garage for L	
Weight		
Order Received	1.10 a.m.	M. Cartage
Time Started	1.12 a.m.	M. Returned 3 a.m.
Foreman	Schubert	Driver Crandall
		Totals

Sample of Record That is Entered in Triplicate for Every Order Received

1. Henderson 5 p.m.
7 Willits 5.30 p.m.
~~Flint~~
7 Curtis 7 p.m.
7 Conrad 5.30 p.m.

Depew-Axle Works

Out 3 tanks on main
building waited 1 hr 30
min. for rivets for last
tank. Men in by train.

Sample of Simple, but Complete Record of Each Job Kept in a Book in the Office

In the original the name Henderson is in blue, to indicate that he is foreman; Flint is crossed out, showing that he was down for the job but did not show up—Conrad substituted; Curtis is in red, indicating that he is the driver of the truck.

of another man written below that of the driver. When they report in from the job the time of returning is placed after the name of each man. A difference in the time of returning will indicate that one or more men were required on the job longer than the others; the nature of the job will usually explain whether the late one stayed to bring in tools or what the reason was.

The foreman writes a brief account of the work done and the reason for any delay. This account by the foreman has more than once saved the firm money, for when a customer protests that the men who came with the truck to do certain work at his plant did nothing but sit around for a good hour, the Kulp's must be able to give a good reason for the apparent loafing or else reduce the bill.



More Pictures of Commercial Cars "Doing Their Bit" "Over There." They Have Become a Great Factor in the Conduct of the War

1. American troops in France unloading a supply truck. 2. Taking wornout troops for a furlough back to their homes. This branch of the service is known as "Service Automobile Permissionnaire." 3 and 4. Two examples of camouflaged auto roads. 5. British food supply being transported along a road in Flanders



This Great Body of Men Gathered at the New Morrison Hotel in Chicago on February 1st, for the War Dinner of the Society of Automotive Engineers, Which, as
Remarked on the Opposite Page, "Was One of the Landmarks of the Great Engineering Fraternity That Has Gathered Under This Title."

Over fourteen hundred members and guests were present to hear the several speakers. H. F. Kellering, the society's president, was the chief speaker, to be followed by Major W. G. Wall, of the Ordnance Department of the U. S. Army, and by Major Ekencler, a member of the French High Commission. Greetings from President Wilson were received and returned. Ex-president Van Dervort was hostmaster of the occasion and he made an introductory speech which met with the entire approbation of his hearers by reason of its patriotic and encouraging tenor.

S. A. E. War Banquet Most Momentous

By CHESTER S. RICKER

THE War Banquet of the Society of Automotive Engineers, held at the New Morrison Hotel in Chicago, February 1, was one of the landmarks for the great engineering fraternity which has gathered under this title. There were no less than 1400 members and guests at the dinner. The after-dinner speeches sounded a keynote in the national and industrial importance of the society.

Ex-President W. H. VanDervoort acted as toastmaster and was introduced by H. L. Horning. President H. F. Kettering, of the Society, was the leading speaker of the evening, followed by Major W. G. Wall, of the Ordnance Department of the U. S. A., and Major Eckenfeler, of the French High Commission. A telegram was received from President Wilson expressing his best wishes and thanking the Society for the work it was doing. Another was received from General Tossi, who was to speak on behalf of Italy, but who was detained at the last moment. Mr. Horning read a telegram that he had prepared in answer to President Wilson's, expressing the loyalty and patriotism of the Society to the task of making "Democracy safe."

Ex-President VanDervoort's introductory speech was much appreciated by his hearers, because he minced no words in either commendation or condemnation of things which had been or were being done. He scored what he called the criminal neglect illustrated in our unpreparedness when we entered the war, due to petty politics at Washington, and lauded the work which has been done in 8 or 9 months equal to that which has taken our allies three years or more to accomplish, but which cannot be told to the public in detail because of the military necessity of censorship.

Work of Both the Secretaries Upheld

He upheld both the Secretary of War and Secretary of Navy. Their work, he pointed out, is of such a nature that the public cannot be fully advised as to what they have done. He compared the requirements of the Navy and the Army at the declaration of war. The former was a going organization when war was declared, while the latter was little more than an infant in swaddling clothes. He also scored both the Fuel Administration and Labor when he pointed out that in the trenches they were working 24 hours a day, while here we had to loaf two days a week and now labor wanted a 7-hour day instead of an eight. He asked, "Where is your patriotism when you allow such a thing? Our industries must run at full tilt. There must be no restriction of production. What will your boy 'over there' think of you if you show such weakness?"

President Kettering had two messages to give the Society, one concerning the fuel problem and the other "America's Greatest Asset." The fuel problem is the

one of greatest import to all industries today, because it means the curtailment of truck, passenger car, power boat, airplane, farm tractor and gas engine production. Something must be done to anticipate the reduction in the supply of gasoline, crude oil and coal. He pointed out that 125,000,000 acres of land are used today to raise food for horses, which are the most expensive means of obtaining power. The wise but unthinking American people have put such a tax on one of the most valuable fuels as to make its use prohibitive, i. e., alcohol. By raising grain to make commercial alcohol it would be possible to obtain four times the energy from internal combustion engines that is obtained from the horses that consume the grain on the great acreage mentioned above.

Quantity Production Great Asset

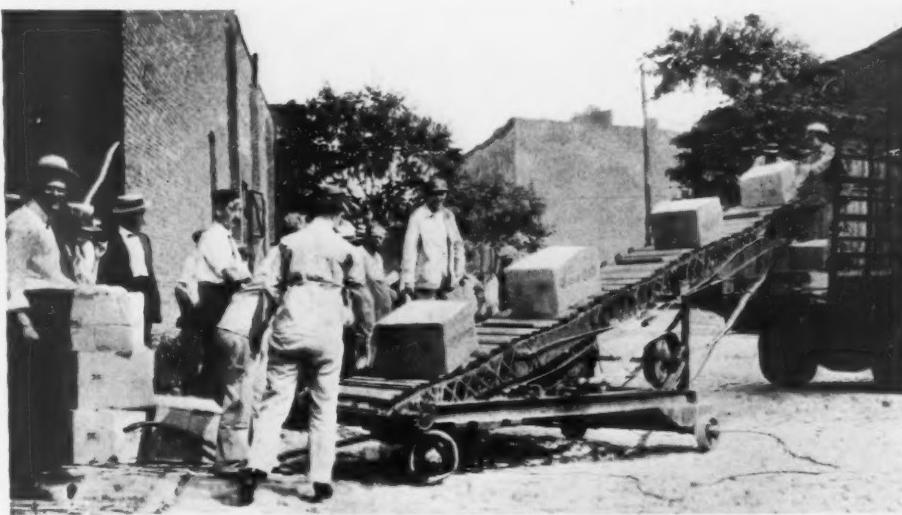
Our greatest national asset, so Mr. Kettering felt, is the ability to manufacture in a production way that is without parallel in any other country. At the present time our hands are tied by theoretical limits rather than practical ones. For example, he cited an instance where bayonets were scrapped because they were .003 in. too thick, but practically they would have killed a man just as well. Now that this question of limits was being modified to suit conditions not theoretical, production will come along much better. What we all want, he said, is constructive criticism and not destructive. Tell the man what criticism you have and you will both profit by what you learn. He may be

right. The results of cementing so many industries together that originally were competitive is going to be of inestimable value to every one—and to the country.

Major W. G. Wall gave a short talk on the progress which had been made by the Ordnance Department in the short period of time which they have had in which to make their preparations. Already 3000 men are under training in this department and they will have the necessary ordnance for 3,000,000 men before the summer. Standardization has done much for the work of preparing tanks, trucks and other apparatus necessary to the transport work of the department. For example, the truck bodies are designed to carry from 1,000,000 rounds of rifle ammunition to 5 rounds of the big shells without any change and without waste space or looseness between the boxes. We have nearly 10,000 caterpillar tractors and are making over 2000 trucks a week for this department. There are now said to be more tanks completed in this country than have been built by England and France during the progress of the war.

The French Major, Eckenfeler, gave some reminiscences of his trials before Verdun and the part which the trucks played in the defence of the place. Without them it would have been absolutely impossible to have held the position.

Republic Motor Truck Co., Alma, Mich., plans to establish an assembling plant at Roanoke, Va., in the near future.



Women War Workers in Training at the Bush Terminal to Take the Places of Drafted Men

At the Bush Terminal in Brooklyn, N. Y., women are being trained to load motor trucks with automatic conveyors, drive the trucks when loaded and operate tractor cranes that handle strings of trailers, to do the work of men taken in the draft. They are learning something of the theory of electricity and motor construction, in classes, and the actual work is done under the direction of men who are at present employed. By careful selection of girls who are physically strong, and who have a talent for mechanics, the Terminal expects to develop a thoroughly efficient force of women to meet any labor shortage. The places left vacant by these women, in offices or factory, can be filled with less difficulty, so the stenographers, clerks and factory girls who like outdoor work are trained to these more strenuous tasks.

Petroleum Experts Now State Surplus Instead of Shortage of Gasoline

But recently Mr. A. C. Bedford, Chairman of the Petroleum Committee of the Council of National Defense, made the statement that conservation of gasoline was absolutely necessary if we did not want to face a gasoline famine. Mr. Bedford has recently changed his attitude and now makes the important statement.

"There is no shortage of gasoline for use in this country. As a matter of fact, as a result of the light domestic demand incident to the winter weather, the stocks of gasoline are increasing and will further increase before the heavy summer demand is encountered."

"Experience and inquiry make it clear that the petroleum industry in America can and will supply all the increased demand for oil products for the war, provided sufficient tank steamers can be obtained. It is estimated that in 1917 not over 25 per cent of the gasoline produced in this country was exported. That fact should be reassuring to anyone who doubts this country's ability to supply the war requirements of our own and our allied governments for this important product."

Detroit Automobile Makers Form Shell Company

The Detroit Shell Co., capitalized at \$2,000,000, was recently organized in Detroit, and has taken over the immense new plant of the Springfield Body Co. which is being put in readiness for the manufacture of munitions. John Kelsey, president of the Kelsey Wheel Co., is president; Harry M. Jewett, of the Paige Motor Car Co., and Roscoe B. Jackson, of the Hudson Motor Car Co., are vice-presidents; Edsel Ford, of the Ford Motor Co., treasurer, and J. Walter Drake, of the Hupp Motor Car Co., secretary. The incorporation followed the visit to Detroit of Hugh Chalmers, A. W. Copland and John R. Lee, who compose the Automobile Industries Committee at Washington, and their tender of an initial munitions contract for \$30,000,000, with the prospect of more business to follow. The company was fortunate in securing the plant of the Springfield Body Co. in Springwells, which is admirably adapted to the requirements and contains 200,000 sq. ft. of floor space. It is expected that between 8000 and 10,000 men will be employed.

Pays Own Truck Expense—Accommodating Patrons

The Smith Bros., commission merchants, of Oil City, Pa., have established a permanent truck route from that city to Franklin and Rouseville. They make a return trip from each point daily. Their charges for deliveries range from five cents to twenty-five cents, according to the size of the package, and this more than pays all running expenses of the truck.

Need for this service came about through embargoes, shortage of cars and time lost in transferring from the Pennsylvania Railroad to the New York Central in order to reach the towns mentioned.

The time saved and the economy resulting have been observed by other shippers in that section.

Armour & Co., meat packers and shippers of that city, have advised their customers in the meat trade that they are putting on a large truck, February 1, to run daily to Franklin and to Titusville.

Highways Industries Association Formed at Chicago

The Highways Industries Association was formed at a meeting held in the Congress Hotel, Chicago, January 21, 1918, of approximately 150 officials of industrial manufacturing plants pertaining to road material.

The association was organized by the adoption of a constitution and the election of S. M. Williams, Lima, Ohio, as president and S. T. Henry, of Washington, D. C., as secretary.

Although Chicago is favored as the national headquarters of the Association, temporary headquarters are maintained at Lima, O.

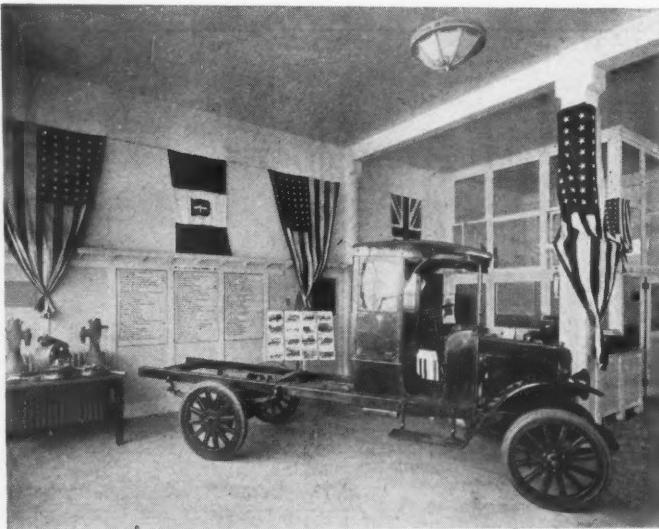
The importance of the meeting is due to the fact that it was the first time in the history of the nation that all industries directly interested in the use and construction of public highways came together to agree to work as a unit, so that our highways may be developed along intelligent and progressive lines.

The spirit of the meeting was the determination that now is the time to build permanent "good roads."

Steel, road-making materials, machinery the press, motor trucks, truck tires, engineers, motor parts, municipalities, civic bodies and public officials were among the interests composing this timely movement.

Among those who addressed the meeting was James I. Blakeslee, Fourth Assistant Postmaster General, Washington, D. C.

Truck Department of the Maxwell Branch Located in New York City



Mr. DeBear, manager of the Maxwell New York branch, at 59th St., is very devoted to the commercial car. Upon the easel are various body designs adapted by Maxwell users in various lines of business. Upon a table are displayed parts of the truck showing the various constructions and competent men are in charge to give information to the interested business man. This department, although in the same general room with the passenger cars, is run entirely separate. Mr. DeBear's success shows that it is not impracticable to run a salesroom in which both the commercial and passenger ends of the business are displayed.

Mr. Blakeslee is in charge of the United States postal rural delivery service and has been a firm advocate for appropriations to establish motor truck parcel-post routes, urging the employment of motor truck routes where there was even the possibility of maintaining a schedule. Among the instances cited by him is a route from Oxford, Pa., to Philadelphia, 120 miles round trip. The cost of placing a motor truck in service amounts to \$4200 per year and the truck earns \$30 per day, or, with a daily mail freight of 720 lb., its earnings are \$9000 per year. The truck has bucked the snow successfully. Another instance is the projected postal route from Columbus to Zanesville, Ohio, which it is expected will go into operation about March 15. He mentioned that from Atlanta, Ga., roads radiated to nine county seats in a rich agricultural country which have no railroad connection with that city—citing it as an illustration where through the use of the motor truck "time now worth nothing would be made worth money."

The consensus of expression in the meeting was that there is no better time to construct trunk lines than the present; that the United States will not permit promiscuous road work; that State Commissioners should work in harmony with transportation companies.

Maxwell to Start Production on New Farm Tractor

The Maxwell Motor Co., Detroit, Mich., has announced that it is on the eve of production for the farm tractors which it has been working on for the past five years. The plan to add this new product to the Maxwell line was revealed at the Maxwell-Chalmers Dealers' Dinner held during the Chicago Show week. Motion pictures provided the means of presenting the tractor, several reels being shown. It is said that the tractor is very complete and embodies unusually new tractor features.

Selden Motor Vehicle Co., Rochester, N. Y., is planning the erection of an addition to its plant to cost \$100,000.

Thirteenth Annual Meeting of the S. A. E.

Activities Revised at Yearly Session Liberty Engine Design Discussed

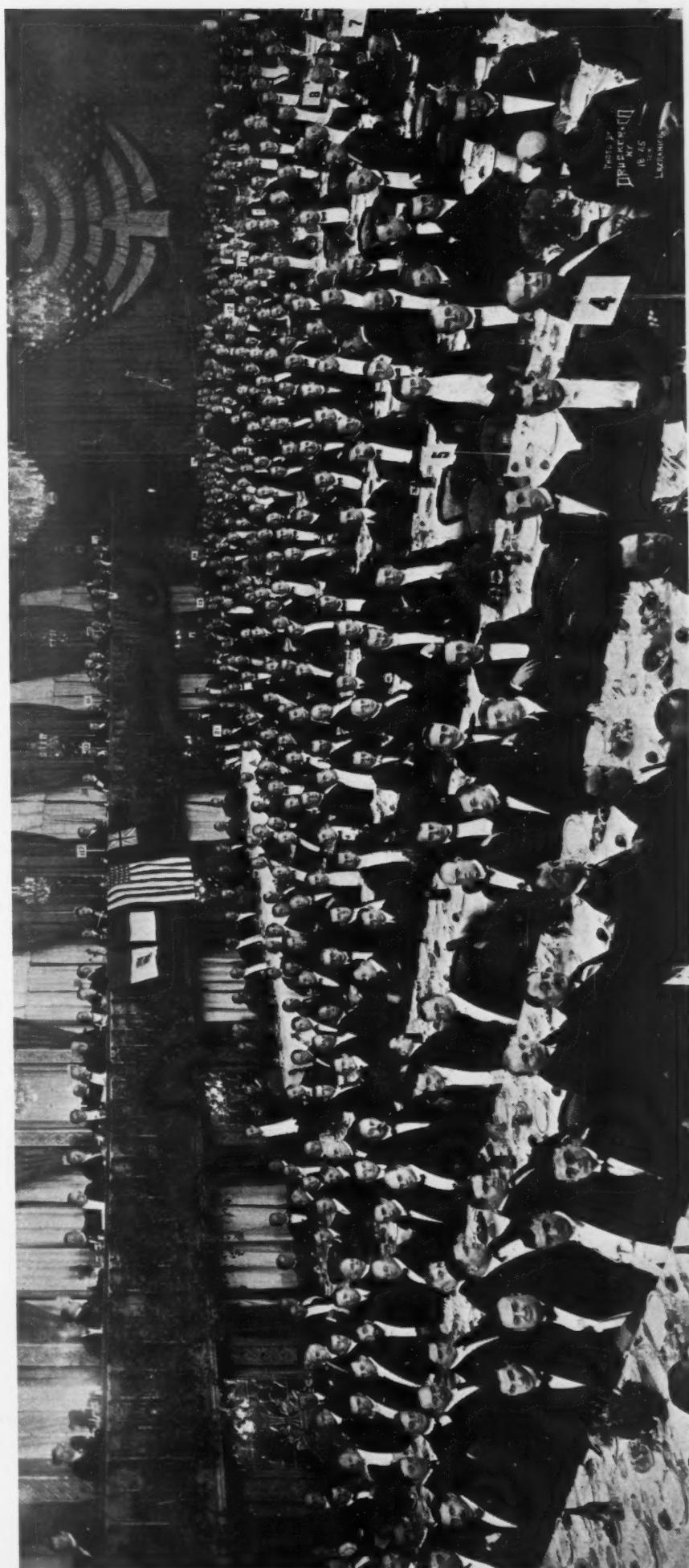
ONE of the most eventful years in the history of the Society of Automotive Engineers was brought to a successful conclusion at the Thirteenth Annual Meeting. The national importance of this Society is now known to all, due to the effective service rendered the Government since war work has become the first consideration. Many of the engineers from the Society are serving the country in various capacities and over one hundred are Commissioned Officers in the Army at the present time.

At the professional session of the society complete details of the Liberty engine and the government airplane program were revealed for the first time. Col. V. E. Clark, Q. M. C., U. S. A., spoke of the part the planes will perform in winning the war and the requirements of pilots in operating the different types. H. M. Crane, of the Wright-Martin Co., told of the problems underlying the building of the Liberty engine, and of the impracticality of subjecting a foreign-designed engine to American methods of manufacture. Major Jesse G. Vincent outlined the processes by which the Liberty aircraft-engine was designed.

Col. Clark talked on the various types of planes and their use. He pointed out that there were three distinct types: the observation, the combat and the destruction or harassing machine. The demand today, he said, was for the three-man observation machine and that for this it was desirable to have a 500-hp. engine.

The retiring president of the society, George W. Dunham, addressed the members, reminding them that, aside from the important work which the society has accomplished in co-operation with the Government, a significant achievement of the year is the completion of a plan for the unification of the engineering activities of all the automotive industries; that the membership of the society has increased 47 per cent during the year, 999 members having been enrolled, and that financial matters of the society stand on a very satisfactory basis. He recalled the well-attended and successful meetings held during the year, the aeronautic session and the first and second tractor sessions held in connection with the Kansas City and the Fremont tractor demonstrations respectively.

The dinner, which closed the meeting, was the largest and most successful in the history of the association. Although a thousand tickets were sold, there was still a long list of applications which could not be filled. John Kendrick Bangs, as toastmaster, introduced the speakers: Major J. G. Vincent, C. F. Kettering, who had been elected president of the Association at the annual business meeting, Captain M. E. de Jarney, member of the French Commission in this country, and Howard E. Coffin, chairman of the Aircraft Production Board.



Dinner of the Society of Automotive Engineers, Held During the Show Week, at the Biltmore, New York City

How Chicago Commercial Car Dealers Took Advantage of Chicago Show Week

By GEORGE BROWN

COINCIDENT with the opening of the doors of the Eighteenth National Chicago Automobile Show, on Motor Row, Wabash Ave., at the curb in front of the Coliseum and scattered practically in every salesroom in Chicago, a commercial car show was held by the dealers. For variety of models manufactured and interest by both dealers and prospects, this show appealed to so great an extent that the volume of orders and sales recorded is unparalleled in the history of the commercial car.

There are many reasons why this outside and scattered exposition was so successful. Those interested in haulage or transportation have become educated to the fact that power for their purposes is an essential. Transportation conditions on, or dependent on the railroads have failed so utterly to meet present needs due to the war that motor trucks afford the only relief for conditions which have much or more to do with the high-cost-of-living than any other factor to be considered.

Some of them are as yet strangers within Chicago's gates and their representation was limited to the time of "Show Week." Many of them did not bring any of their products with them, yet from their headquarters in suites in the leading hotels, numerous orders were booked from dealers who had never seen the product, and stranger yet, there were several instances where orders taken from teaming companies with scarcely any trouble, except invariably one condition—for as prompt delivery as possible.

The following commercial car models were displayed:

Runs an All-Year-'Round Show

The Autocar Co., in its completely equipped sales and service branch, 753 W. Jackson Boulevard, was a center of attraction. Manager Kirke B. Harwood said, "Yes, business is excellent, we run an all year-round show." And yet there has been a perceptible increase of interest and orders coincident with "Show Week."

Henry Paulman & Co., 2420 S. Michigan Ave., in the heart of Motor Row, spread themselves somewhat, displaying in their beautiful show rooms a complete line of Pierce-Arrow trucks. Henry Paulman as usual used the opportunity in the cause of "Good Roads" and the advancement of power haulage.

G. W. Stratton, president of the Stratton-Gramm-Bernstein Co., 2438 S. Michigan Ave., a recent graduate into the ranks of motor-truckdom from the passenger car line, had the pleasure of securing many signatures to orders for Gramm trucks of various capacities from among his numerous friends of former passenger car associations. His new and spacious salesroom was really a "Show Week" hive of industry.

Of the Chicago manufacturers, Manager Cushing, of the Sandow Motor Truck Sales, appreciated the opportunities for pushing the Sandow sales by an attractive display in their salesrooms on Motor Row. They also had an attractive display behind a plate glass front in "Pneumonia Alley," where users of a transfer from the Coliseum to the First Regiment Armory were compelled to pass. Determined to lead, a 1-tonner Sandow was an additional motor truck point of interest in the lobby of the Sherman Hotel and the latch string was out to permit motor "Show" visitors to inspect the extensive production facilities of the new Sandow motor truck plant in Chicago.

The Day-Elder Motors Corp., manufacturers of D-E worm-drive motor trucks, Newark, N. J., was represented by Charles P. Day, president; P. K. Hexter, vice-president and general sales manager; H. G. Ried, district sales manager, and Jackson H. Kelley, eastern sales division, at the Congress and by a display of their product in a temporary salesroom, 11 E. Harrison St.

Closed for Several Agencies

The Clyde Cars Co., makers of high grade motor trucks, Clydesdale, Clyde, O. exhibited at the Schuett Motor Car Co., 2538 S. Michigan Ave., their 1½, 2 and 3½-ton models. Wm. J. Chipman, factory representative for the mid-west, announced the closing of deals for agencies in Memphis, Tenn.; Milwaukee, Wis.; McKeesport, Pa.; Baltimore, Md.; Washington, D. C.; Fort Smith, Ark., and Dallas, Texas.

At the Chicago Bethlehem Sales Co., 2241 S. Michigan Ave., Howard B. Hall, president and formerly assistant general sales manager of Bethlehem Motors Corp., Allentown, Pa., conducted a motor truck show comprising a stripped chassis and a complete line of "A-1" 1¼-ton and "B-1" 2¼-ton trucks and a complete line of bodies.

The United States Motor Truck Co., Cincinnati, Ohio, factory, Covington, Ky., assembled in their headquarters at the Sherman Hotel.

The Pollock-Richard-Hirsch Motor Co., 2037 S. Wabash Ave., last year entered the Chicago field with the "Available" 1½, 2, 3½ and 5-ton and the "Rainier" ½, ¾ and 1¼-ton worm-drive motor trucks. This establishment also handles Warner trailers for the Chicago territory. They report unusual interest and orders during "Show Week."

The Fulton Motor Truck Co., Farmingdale, Long Island, N. Y., exhibited a model 3000 lb. capacity in the Auditorium Lobby. The company was represented here by Wm. F. Melhuish, Jr., president, H. Flint, assistant sales manager and a

staff of representatives, among them Tommy Forbes, N. Whitstone and Charles J. Pupki, manager of the service department.

The Autohorse, manufactured by the One Wheel Truck Co., St. Louis, Mo., secured an advantageous position on Wabash Ave., at the curb, or rather against the huge snow banks directly opposite the main entrance to the Coliseum. The sign on this one wheel tractor truck read "Sell your horse and buy me." They attracted much attention, although they were out in the cold. However, they also had an exhibit under cover at 1424-26 S. Michigan Ave.

The United Motors Co., Grand Rapids, Mich., in a temporary sales room on Wabash Ave. near 12th St., had on the floor the new series of United motor truck models for 1918, of 1, 2, 3½ and 5-ton capacities. J. M. Case, sales and advertising manager, was in charge of the exhibit, which, when the writer called, gave evidence of success with a number of interested visitors inspecting the large display.

The Harvey Motor Truck Co., in its new down-town salesroom, Wabash Ave. near 12th St., displayed a 3½-ton Harvey (Model W. H. A.) finished all over in white. It made a striking Show feature.

The Famous Trucks, Inc., of St. Joseph, Mich., exhibited their light-delivery trucks in ¾-ton capacity in the Greer Building adjoining the Coliseum on Wabash Ave.

Service Station on Exhibition

Manager George A. Crane, of the Garford Motor Truck Co., Inc., Chicago Branch, 23d St. and Indiana Ave., in one of the most spacious salesrooms and complete motor truck service stations in the country, with his sales staff, found "Show Week" extremely lively for motor truck business and prospects. This complete sales and service plant was a mecca for many of those interested in where everything necessary for haulage was on sale and all appliances necessary to keep motor trucks moving are always available.

In the Federal Motor Truck Co.'s Chicago Branch, Wabash Ave. and 21st St., as a Show exhibit, Manager Nichols had on his floor a 2-ton Federal truck, sold to M. J. Tober, Peru, Illinois, for a transfer line. A particularly interesting display was a tractor and trailer for a lumber job. This branch announced the closing of contracts with several agencies and the fact that a large number of mid-west dealers had closed contracts at the factory "Show" headquarters in the Blackstone. Eighteen dealers were entertained at dinner at the Illinois Athletic Club.

Knickerbocker Motors, Inc., represented by W. R. Thompson, assistant to the general manager, had a Form-a-Tractor in the lobby of the Lexington Hotel as a "Show"

attraction. Their folder "Introducing Knick and Henry" was extensively distributed.

The McIntyre Motor Products Co., 100 W. 55th St., displayed a Ford 1-ton truck-maker, an extension for Ford Model "T" chassis to carry a 9 ft. body back of the seat, with a carrying capacity of a ton, at a price of \$40.00.

The Diamond "T" Motor Car Co., 4509 W. 26th St., had a gratifying attendance of those interested, at their plant and the Louis Geyler Co., 2500 S. Michigan Ave., selling agents for the company's product, displayed a full line of all models.

Did Business Without Exhibit

The Duplex Motor Truck Co., of Lansing, Mich., represented by Alex Smith, maintained headquarters at the Congress. Although this company had no exhibit, nor Chicago representation, a contract was closed with J. F. Murphy, well known in motor car circles in St. Louis and Memphis, to handle Duplex trucks in Memphis territory. Two important agencies and a number of orders were closed by Andrew Langenbacher, sales manager of the Duplex Co., who was also on the spot, permeated with business opportunities.

T. F. Hamilton, manager of the Service Motor Truck Co.'s factory branch, at 2617 Wabash Ave., said, "There is always a 'Show' in this salesroom and yet judging from sales this week I wish the Automobile show would be continuous. We were surely busy with prospects and orders during 'Show Week.'"

The Republic Motor Truck Co., Alma, Mich., displayed at its Chicago branch, 1702 S. Michigan Ave., a full line. Manager Vliet, anticipating increased sales during the Show, displayed all models and body types in the standard color, brilliant chrome yellow, which certainly caught the eye and attention. "I must say," said Manager Vliet, "that 'Show Week' has been business for us at the peak."

"Although Automobile Show week was one of the coldest of an exceptionally cold Chicago winter, it seems that the severity of the weather is a business up-lift," said Harry P. Braunstetter. "You see I have palms and Kissel trucks in my salesroom at 26th St. and Wabash Ave. and they get out of the cold and under the palms to register their orders for Kissel trucks. We have had a lively and profitable 'Show Week.'"

The International Harvester Co. of America, Inc., has been entertaining a multitude of its agents in the Harvester Building. This company enjoyed a record week for results.

Ran Free Motor 'Bus to His "Show"

Harry Newman, at S. Michigan Ave. and 25th St., who is well known as a motor car dealer, since adding the Maxwell truck to his line, has reaped the reward which follows transportation economy. With methods in the business bordering on the sensational and yet with selling appeal, his stunt during the Automobile Show was to run a Maxwell free-bus between his salesroom, the Congress Hotel and the Coliseum to the motor truck "Show" he maintained for the week on the main floor

of his business enterprise. Maxwell motor truck orders followed.

"Electric motor truck advantages are well known, or otherwise," said George Sigmund. "The many who have gone out of their way to inspect and order General Electric vehicles at my place, Carroll Ave. and Ada St., would not have taken the trouble. We felt the beneficial effect on business during 'Show Week' fully as much as any of our gasoline commercial vehicle competitors."

H. R. Bruah, president and general manager of the Hudford Co., of Chicago, Inc., 1456 S. Wabash Ave., said "Of course I have had my advantage in having a salesroom located directly opposite the Coliseum, but aside from that the interest in internal gear shaft-driven units has resulted in a remarkable volume of business for us during 'Show Week.'"

A feature of the "Show," that is the outside Show, was the demonstration of the Albaugh-Dover Co.'s square-turn tractor in the vacant lot fronting the alley leading from the Coliseum to the Armory. Interested crowds continually watched the maneuvers of this tractor in the narrow space afforded.

Wheels Formed This Exhibit

The Mead Manufacturing Co., 7952-58 S. Chicago Ave., manufacturers of the Mead Cushion Wheels, demonstrated their use to reduce cartage cost, claiming that this elimination of vibration is fundamental if economies in motor haulage are to be made.

Sales Manager Rouse, of the Knox Motors Co., enjoyed a gratifying volume of business from an exhibit of the Knox Traction Unit in the lobby of the Great Northern Hotel.

Little Giant motor trucks in the salesrooms of the Little Giant Motor Truck Co., 1615 S. Michigan Ave., were displayed in all models and capacities. Body types were shown in many capacities and varieties, mounted on 1, 2 and 3½-ton chassis. Many orders were placed for this popular line.

At the International Motor Co., where Mack trucks were displayed, much interest was evinced among those engaged in heavy hauling.

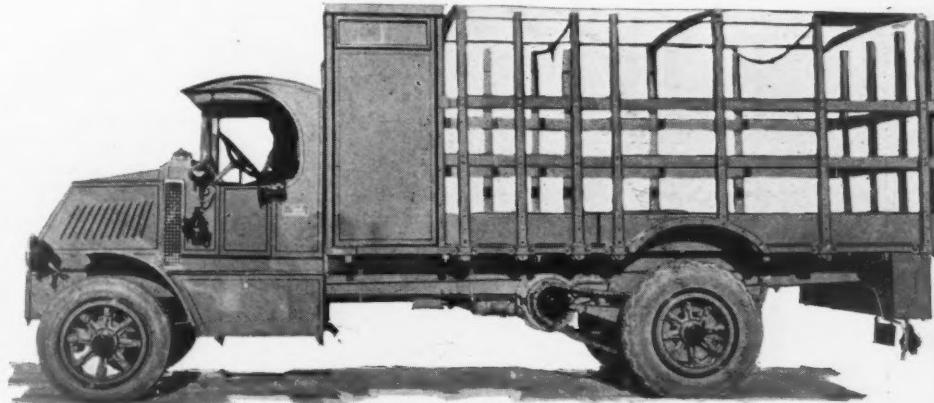
Master Motor Trucks, Inc., had one of their models stationed at the curb opposite the Coliseum during "Show Week" with a sign on the top stating it was a unit of a motor truck freight line soon to be established between Chicago and New York.

Many other exhibits where business was favorably affected by the attendance at the "Show" are:

General Motors Truck Co., The Globe Motor Truck Co., The Nash Motors Co., Phenix Truck Makers, Inc., The Sanford Motor Truck Co., The G. A. Schacht Motor Truck Co., The Selden Truck Sales Co., The Turnbull Motor Truck & Wagon Co., The Veeder Manufacturing Co., The Vim Motor Truck Co., The Winther Motor Truck Co., The Brockway Motor Truck Co., The Maxfer Truck Sales Co., The Tractor, The Chase Motor Truck Co., Nelson & LeMoon Motor Truck Manufacturers, Chicago; Chevrolet Motor Car Co., The White Co., The Fargo Motor Truck Co., manufacturers, Chicago; The Ford Motor Co., The Denby Motor Truck Co., Dodge Brothers, The Globe Motor Truck Co., The Hendrickson Motor Truck Co., manufacturers, Chicago; The Howe Motor Truck Co., The Kelly-Springfield Motor Truck Co., and The O'Connell-Manley Motor Truck Co.

Cleveland Engineers Hear Talk on Tractors

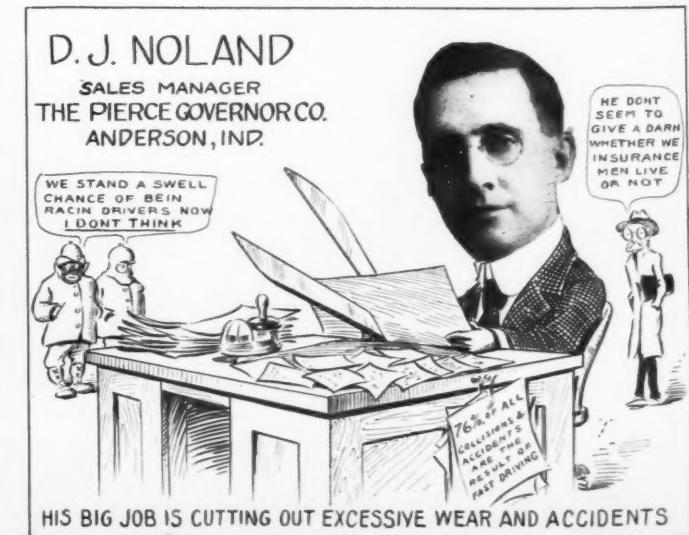
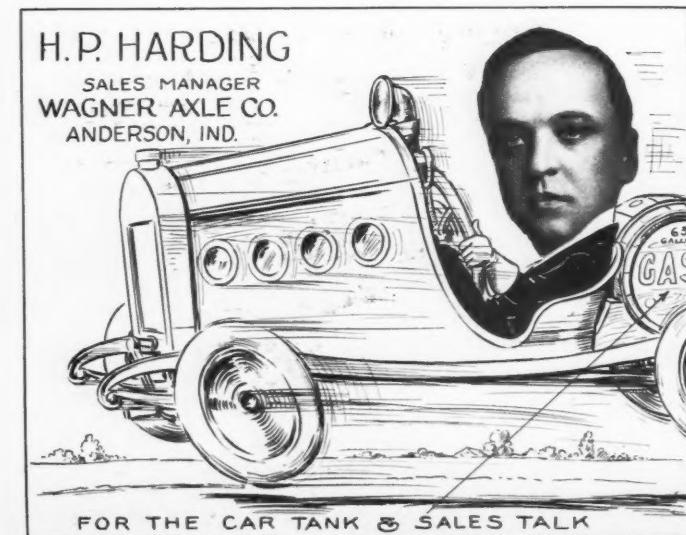
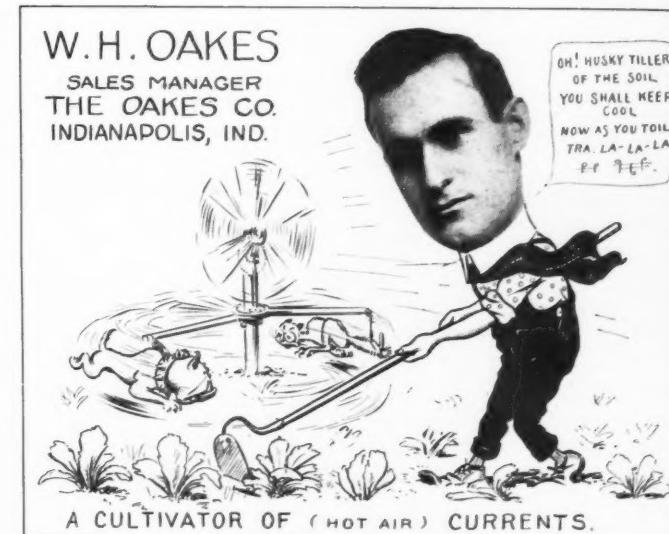
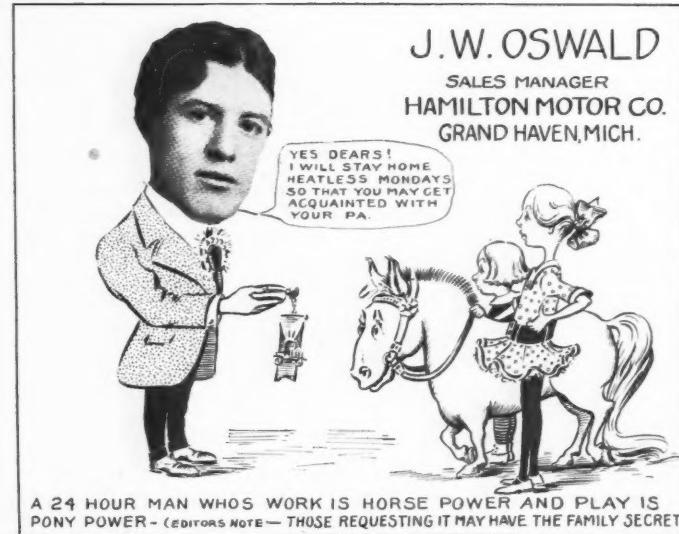
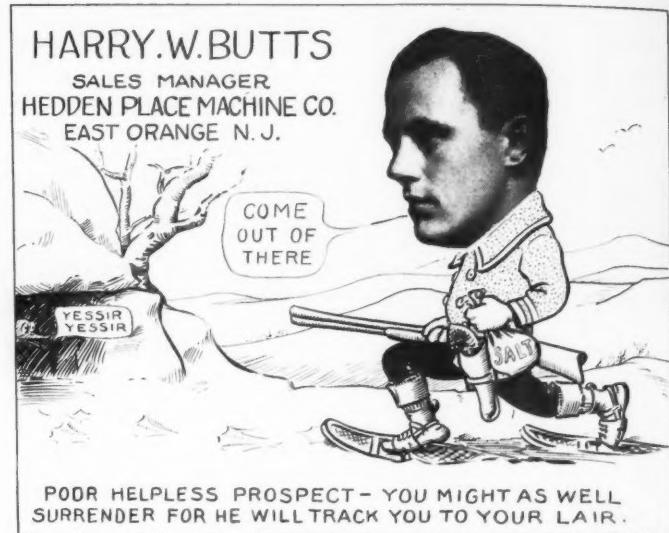
At a recent meeting of the Cleveland section of the Society of Automotive Engineers at the Hotel Statler, P. E. Holt, of the Holt Mfg. Co., Peoria, Ill., addressed the members. His talk was concerned primarily with the various uses to which the tractor is being adapted, especially in war work, the Holt farm tractor having been an important factor in the development of the modern "war tank." Mr. Holt used moving pictures and lantern slides to illustrate his talk.



This Three and a Half Ton Mack, Under Full Load Made an Overland Trip From New York to Akron, Ohio, 533 Miles, in 49 Hours

The actual running time is here quoted, the complete time being 60 hours. Roads were covered with snow and sometimes the temperature registered 13 degrees below zero. This truck is to make regular trips between Akron, New York and Boston, for the Goodyear Tire and Rubber Company. Pneumatic tires are used, the front being 7 in. and the rear 10 in.

CCJ GALLERY of SALES MANAGERS



THE COMMERCIAL CAR JOURNAL

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Dividing Commercial Car Maintenance

A N idea that may appeal to others who are in doubt as to whether their own business justifies a motor truck has been adopted by a firm of commission merchants in Oil City, Pa., and has proved very efficient.

This company runs a motor truck route from its city to Franklin and Rouseville, and accommodates its patrons and others by delivering parcels for them anywhere within its regular route, charging a nickel to a quarter, depending on the size of the package. It is said that by conducting this sideline express service the company more than pays the running expenses of the truck.

There is great need of transportation of merchandise between points that are not well taken care of now by railroads and other agencies, hence it is certain that the enterprising man who starts the first truck over any such route will be able to get lots of business beside his own, if he wants it. What some prospective purchasers can well afford to do is to remember that there are likely to be others in need of service besides themselves and to stop figuring solely on their own

wants. The dealers also should offer the suggestion to prospects who have raised the question of the probable economy of a truck in their own use.

More About Highway Freight Service

IN a news item recently received from the Packard company, was the following warning which is worth heed:

All of our great railroad systems are overburdened with an unprecedented volume of freight. Many have periodically declared embargoes while they made frantic attempts to catch up. Meanwhile conditions have steadily become worse instead of better. And if our transportation system breaks down, which it is in danger of doing, the safety of the nation will be at stake. An enormous amount of freight could now be diverted from the railways to the highways, if good ones existed throughout the nation, but our great national transportation need finds us with only one-tenth of our 2,500,000 miles of public roads available for heavy motor-truck traffic.

A good part of the space in the January issue of the COMMERCIAL CAR JOURNAL was given to articles pertaining to the use of motor trucks in highway freight service and at the time this was gathered so much was received as a result of the campaign that we were unable to get it all in that issue.

Continuation of that matter will be found in other pages of this issue. It is urged that those who are not fully alive to the potentialities of the commercial car for short haul freight handling when an adequate truck-worthy system of roads is available will do well to study the material in both the January and February issues of this publication.

As we have said before and repeat here, those in the motor car trade will be working in their own interest by speaking a word for the good roads movement wherever an opportunity offers.

Show Shippers Motor Delivery Advantages

THOSE who know the facts appreciate that the arguments for commercial car delivery are no longer merely ones of the appearance of up-to-dateness, convenience and rapidity of service. The most important of all—economy over any other form of transportation—has been amply demonstrated. It is hardly necessary any longer even to produce figures to prove it, so generally has it become an accepted fact. The inertia of the business world—an indisposition to relinquish the old way for something new—is today the biggest obstacle to commercial car sales, and largely this is a matter of such absorption in the other considerations of business conduct that thought of a change of transportation methods is not spontaneous.

We have been harping on the unprecedented opportunity that confronts the commercial car field just now for accelerated expansion. Forced growth is no longer called for; fertile soil is ready everywhere and seed has been sown abundantly. Diligent cultivation is wanted now for a fruitful harvest in the very near future. The thing required is to impress on shippers and business folk generally the important place that commercial motor cars already occupy.

Problem of "Over the Road Truck" Tires

IN these days of pressure, these strenuous times, the automobile and the truck dealer are forced to do many things that were never done before. It is getting to be quite the habit to run the trucks over the road where the distances are not too great, and even in extreme cases, trucks have been driven as far as 1000 miles in order to make deliveries.

Recently there was a case in court where a man refused to take his machine because of slight damage to the tires, due to having been run over the road. In this particular instance the court ruled, that under the present conditions, the dealer, not having facilities for shipment, was perfectly right in delivering the truck under its own power and therefore, no damages could be collected for slight tire wear.

This has set a precedent. Trucks are more and more being delivered over the road and before the war is over it may be necessary to carry this method to even greater lengths.

True patriotism would not hesitate to accept a vehicle with slight damage to the tires. That is the least any patriotic business man can do for his country. Any man who refuses to take a vehicle on this account is certainly anything but patriotic. We should emulate the modern Greek who said, "A boot from my own country—let it even be patched."

Perhaps some inventive genius will supply suitable tire protectors or special wheels can be used.

Metal and Rubber Markets

Government Absorbs Steel Mill Output

There is practically no steel market at the present time. With Government work keeping all mills busy, the manufacturers with other than Government orders have found it useless to try the market for early deliveries. The curtailment of steel production is seriously felt in many quarters due to the difficulty of securing shipment of coke, coal and pig iron. This has resulted in a reduced schedule of working hours in some mills. Until traffic conditions are restored to nearly normal, relief cannot be expected. Contrary to general belief the shut-downs ordered by the Government had absolutely no effect on production as many mills are so cluttered with accumulated finished products that it is impossible for them to proceed. Quotations on February 5 were:

Steel Products Prices

Bessemer billets, per ton, mill. \$47.00 a ...
Open hearth, per ton, mill. 44.50 a ...
Forging billets, per ton, mill. 60.00 a ...
Sheet bars, per ton. 51.00 a ...

SHEETS

The following prices are for 100-bundle lots and over f.o.b. mill:

Blue Annealed Sheets—
Nos. 3 to 8. \$4.20 a ...
Nos. 9 and 10. 4.25 a ...
Nos. 11 and 12. 4.30 a ...
Nos. 13 and 14. 4.35 a ...
Nos. 15 and 16. 4.45 a ...

No. 17 and lighter gauges are based on \$5.50 a 7.50 per 100 lbs. for No. 28 Bessemer Black sheets.

Box Annealed Sheets, Cold Rolled—
Nos. 17 to 21. \$4.80 a ...
Nos. 22 to 24. 4.85 a ...
Nos. 25 and 26. 4.90 a ...
Galvanized Sheets of Black Sheet Gauge—
Nos. 10 and 11. \$5.25 a ...

A good practice, however, is for the dealer to pre-arrange with his prospect for "over-the-road delivery" and then there is no comeback.

Express Rates Do Not Have to be Paid if Express Service is Not Rendered

IT is quite the custom in the trade to order parts, and even heavy parts by express. Frames and even heavy castings, the express on which amounts to much more than the cost of the parts, are now quite commonly received by express shipments.

Unfortunately, however, even this method does not insure the prompt receipt of the goods ordinarily expected. Many firms have been paying express charges and receiving the goods about as slowly as they would have come under ordinary conditions by freight.

The crux of the situation is this—in any case, where the express company fails to deliver the goods at express speed, in fact no better service is rendered than would be accorded by a freight shipment, if these facts are laid before the express company and a refund of the difference in cost between freight shipment and express shipment demanded, the express company will refund the money.

Do not pay express rates and receive freight service.

Nos. 12 to 14.....	5.35	a	....
Nos. 15 and 16.....	5.50	a	....
Nos. 17 to 21.....	5.65	a	....
Nos. 22 to 24.....	5.80	a	....
Nos. 25 and 26.....	5.95	a	....
 Tin—Mill Black Plate—			
Nos. 15 and 16.....	\$4.80	a	....
Nos. 17 to 21.....	4.85	a	....
Nos. 22 to 24.....	4.90	a	....
Nos. 25 to 27.....	4.95	a	....

IRON AND STEEL AT PITTSBURGH

Bessemer iron	\$37.25	a	....
Bessemer steel, f.o.b. Pitts.	47.50	a	....
Skelp, grooved steel	2.90	a	....
Skelp, sheared steel	3.25	a	....
Ferromanganese (80 per ct.)	250.00	a	275.00
Steel, melting scrap	22.50	a	24.50
Steel bars	2.90	a	....
Manganese ore, per unit	1.00	a	....

Finished Metal Products

Demand continues heavy for all manufactured metal lines and factories, mills and brass foundries continue active. There is more stability to the market now that the price of copper is more certain, but as yet manufacturers do not quote except on specifications. Following prices for brass and bronze products are nominal:

Sheet zinc	\$19.00	a	....
Sheet aluminum, 1917 contract..	42.00	a	....
do. outside market contracts..	65.00	a	75.00
do. outside market, prompt ship	75.00	a	80.00
Aluminum wire, outside market,			
prompt shipment	70.00	a	75.00
Copper sheets, hot rolled	31.50	a	33.00
Copper sheets, cold rolled	32.50	a	34.00
Copper bottoms	39.50	a	41.00
Copper rods	32.50	a	33.50
Copper wire	27.00	a	29.00
High brass sheets	27.50	a	29.50
High brass wire	27.50	a	29.50
High brass rods	24.75	a	26.75
Low brass sheets	30.00	a	32.00
Low brass wire	30.00	a	32.00
Low brass rods	30.75	a	32.75
Brazed tubing, brass	34.75	a	36.75
Brazed tubing, bronze	39.75	a	41.75
Seamless tubing, brass	35.50	a	37.50
Seamless tubing, copper	38.00	a	40.00

Seamless tubing, bronze	42.50	a	53.50
Full lead sheets	9.25	a	11.50
Cut lead sheets	9.50	a	11.50

ALUMINUM.—Demand is light, but there is little offering on spot. Buyers would pay 37c., but sellers hold out for 40c.

TUNGSTEN.—There has been a fair demand for tungsten ores, especially for Wolframite, the price of which ranges from \$26 for the highest grade to \$20 for off grade. Scheelite is held at \$30 per unit by the principal producer, but spot sales have been made at a considerable discount.

Rubber Market Declines

No special interest has been attached to the rubber market since last month's report. Prices have declined somewhat and manufacturers are buying nothing on the spot or nearby and show little or no interest in forward positions. Quotations on February 5 were:

Para—Up-river, fine, per lb....	57½	a	...
Up-river, coarse	37½	a	...
Island, fine	50	a	50½
Island, coarse	25½	a	...
Caucho, ball, upper	37	a	...
Caucho, ball, lower	36	a	...
Cameta	25½	a	26
Ceylon—First latex, pale crepe ..	52	a	...
Brown, crepe, thin, clean....	46	a	...
Smoked, ribbed, sheets	53	a	...
Centrals—Corinto	37½	a	...
Esmeralda	36½	a	37
Guayule	26	a	28
Balata, sheets .....	..	a	85
Balata, block Ciudad .....	..	a	73
Balata, block Panama	54	a	..
Mexican—Scrap	39	a	40
Frontera	39	a	40
African—Massai red .....	..	a	...
Mosambique—Spindles	56	a	...
 DOMESTIC SCRAP RUBBER			
Tires—Automobile	14	a	5
Bicycles, pneumatic	4½	a	..
Inner tubes, No. 2	20	a	..
Inner tubes, No. 2 .....	..	a	10

Buyers' Information Commercial Car Review

(Western Section)

On the following pages is given a complete review of the Commercial Car Models that will be manufactured for the coming season by Western American Manufacturers.

See Complete Indexes on Page 40.

THIS is the second or Western Section of the Review, and includes cars manufactured in the following States: California, Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Oregon, Texas, Washington and Wisconsin.

The first or Eastern Section of the Review was published in January, and included cars manufactured in the following States: Connecticut, Delaware, District of Columbia, Georgia, Kentucky, Maryland, Massachusetts, New York, New Hampshire, New Jersey, North Carolina, Ohio and Pennsylvania.

The data given in this Review was supplied direct by the makers.

Key to Abbreviations will be found on the leaf attached to this page; when this is opened out it will be found very convenient for references. Indexes will be found on page 40.

Criticisms on this Buyers' Information Review are invited.

Horse Power Formula.---All horse powers are calculated by the S. A. E. formula: H. P. = $\frac{D^2 N}{25}$, where D is the bore in inches and N is the number of cylinders.



The other side of this leaf contains the key to the abbreviations used in the

Buyers' Information Commercial Car Review

While consulting the Review turn this leaf out so that it extends beyond the book; it will then be found very convenient for immediate reference.

Indexes arranged alphabetically and according to price are on page 40.

KEY OF ABBREVIATIONS

Used in the Specifications of Cars Included in the Annual Commercial Car Review

Price: Price given in the captions is for the car complete with body as illustrated, unless otherwise stated.

Engine: Beav—Beaver; Buda—Buda; Cont—Continental; Dues—Duesenberg; Emer—Emerson Engineering Co.; Falls—Falls; Fero—Ferro; GB & S—Golden, Belknap & Schwartz; Gray—Gray; H-S—Hall-Scott; Herc—Hercules; H-Sp—Herschell-Spillman; Key—Keystone; Knht—Knight; L.Roi—LeRoi; Lew—Lewis; LM & F—Light Mfg. & Fdry. Co.; Lyco—Lycoming; Mac—Macomber; Mk-P—Massnick-Phipps; Nort—Northway; NAMC—North American Motors Co.; Own—Own; Opt—Optional; Proh—Pruch; Ruth—Rutember; Strl—Sterling; Somr—Sommer; Tetr—Teeter Hartley; Wauk—Waukesha; Weid—Weidley; Wis—Wisconsin.

How Cooled: A—Air; C—Centrifugal Pump; G—Gear Pump; T—Thermo-Syphon; W—Water; P—Water pump.

Make or Type Radiator: Br—Bremer; Bus—Bush; C—Cellular; Can—Candler; Fed—Fedders; H—Honeycomb; Har—Harrison; Lng—Long; May—Mayo; Per—Perfex; T—Tubular; V—Vertical.

Carburetor: Aut—Automatic; B & B—Ball & Ball; Buic—Buick; Cart—Carter; Ens—Ensign; Exc—Excelsior; Flich—Flechter; Gem—Gem; Holl—Holley; Har—Hartman; Hea—Heath; H&M—H & M; John—Johnson; King—Kingston; K-D—K-D; Lgn—Longuemare; Mar—Marvel; Mast—Master; May—Mayer; Mil—Miller; New—Newcomb; Own—Own; Opt—Optional; Ray—Rayfield; Rcb—Richenbach; Stew—Stewart; Strm—Stromberg; Shk—Shakespeare; Sheb—Schebler; Spc—Special; Till—Tillotson; Zen—Zenith.

Ignition System (Make or Type): At-Kt—Atwater Kent; Aut-L—Auto-Lite; AmrB—American Battery; Bosh—Bosch; Berl—Berling; Brig—Briggs; Conn—Connecticut; Delco—Delco; Det—Detroit; Dix—Dixie; Eism—Eisemann; Enty—Entry; G&D—Gray & Hein; Hein—Heinze; King—Kingston; May—Mayer; Mea—Mea; Nat—National; Opt—Optional; Remy—Remy; Simm—Simms; Spld—Splidorf; U&H—U&H; West—Westinghouse; Will—Willard; Mag—Magneto.

Engine Starter: Apel—Apelco; Al-Ch—Allis-Chalmers; Au-L—Auto-Lite; Air—Air; Bosh—Bosh; Bij—Bijur; Delc—Deleo; Disc—Disco; Det—Detroit; Dyn—Dyneto; El—Electric; Entz—Entz; G&D—Gray & Davis; Hein—Heinze; L-N—Leece-Neville; NE—Northeast; Own—Own Make; Opt—Optional; Remy—Remy; R&M—Robbins & Myers; S-H—Simm—Simm; Spld—Splidorf; USL—USL; Wgr—Wagner; W.L—Ward-Leonard; West—Westinghouse; Ex—Extra; 1—Single Unit; 2—Double Unit.

Rear Axle: ABB—American Ball Bearing Co.; AG Co—American Gear Co.; Cal—Cellor; Clev—Cleveland; Col—Columbia; Det—Detroit; Dead—Dead; AG&M—American Gear & Mfg. Co.; Emp—Empire; Gem—Gemco; Hay—Hayes; Hess—Hess; Jbsn—Jacobson; Mott—Mott; Own—Own; Peru—Peru; Russ—Russel; Sals—Salisbury; Sheldon; Timk—Timken; Torb—Torbenzen; Wal-W—Walker-Weiss; West-M—Weston-Mott; Flot—full-floating; $\frac{1}{2}$ -fl—semi-floating; $\frac{3}{4}$ -fl— $\frac{3}{4}$ -floating; $\frac{7}{8}$ -fl— $\frac{7}{8}$ -floating.

Tires: Solid unless otherwise stated: *, pneumatic; D—Dual; T—Triple. **Wheelbase:** Opt—Optional.

Lubrication: C—Centrifugal Pump; Fo—Force Feed; F&G—Force and Gravity; FS—Force & Splash; Gr—Gravity; Sp—Splash Feed; P—Water Pump.

Clutch: B—Band; C—Cone; D—Disc; I—Individual Clutch; U—Unit Control. **Drive:** B—Bevel Gear; C—Chain; Ct—Concentric Spur; F—Friction; I—Internal Gear; O—Own; R—Roller; S—Shaft; SB—Spiral Bevel; Sp—Spur; W—Worm.

Transmission: B-Lipe—Brown-Lipe; Cott—Cotta; Covt—Cover; Det—Detroit; Durst—Durston; Entz—Entz; Fric—Friction; Full—Fuller; G-Lee—Grant-Lees; I-CI—Individual Clutch; Jbsn—Jacobson; Lefv-A—Lefever Arms; Magn—Magnetic; MM Co—Mechanics Machine Co.; M.M.—Motor Machines; Munc—Muncie; North—Northway; Plan—Planetary; Prog—Progressive; Rock—Rockford; Selec—Selective; Warn—Warner.

Spring Suspension: Cant—Cantilever; Ellip—Full-elliptic; S-El—Semi-elliptic, $\frac{3}{4}$ -El— $\frac{3}{4}$ -elliptic, S & $\frac{3}{4}$ —Semi-elliptic and $\frac{3}{4}$ -elliptic; S&C—Semi-elliptic and cantilever.

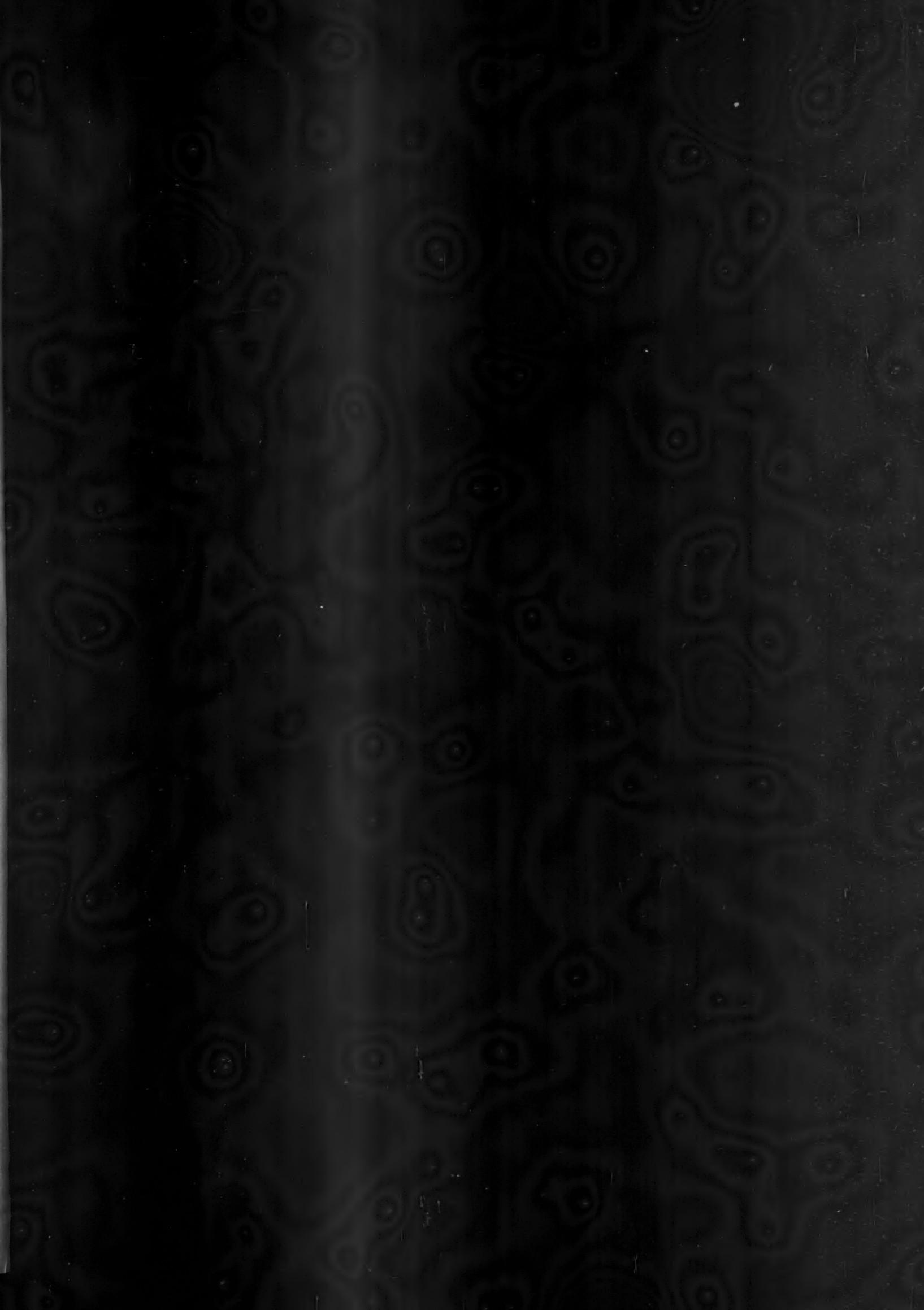
Governor: C—Centrifugal; Dup—Duplex; McC—McCanna; Mon—Monarch; Pier—Pierce; Rug—Ruggles; Simp—Simplex.

EXTRA ABBREVIATIONS USED ON ELECTRICS

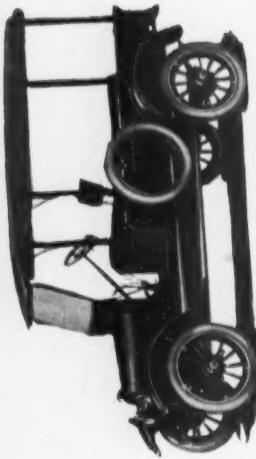
Battery: Exid—Exide; Edis—Edison; Gld—Gould; Opt—Optional. Own—Own; Phil—Philadelphia. **Motor:** Gn-El—General Electric Co.; Own—Own; Wgn—Wagner; West—Westinghouse. **Controller:** Bl—Barrel; C-H—Cutler-Hammer; Gn-El—General Electric; Own—Own; Wgn—Wagner; West—Westinghouse.

Steering Gear: Lvr—Lever; Own—Own.

Indexes arranged alphabetically and according to price are on page 40



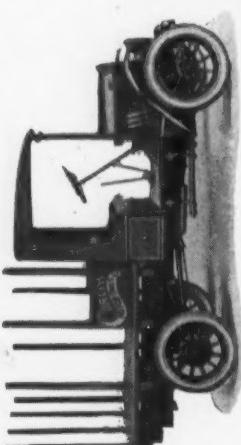
The January issue of the Commercial Car Journal contained the first half of the Commercial Car Review.



Buick 500-lb. Delivery Car, \$790.
Buick Motor Co., Flint, Mich.

500 Pound Gasoline Commercial Cars

Name and Model Number a. c.	Chassis Weight	Own	Horse and Stroke 8 1/2 x 4 3/4	Horse Power 18.2	No. of Cylinders 4	Valve Location Size of Plenum Chambers per cyl.	How Cooled Name of Radiator	Carburetor Name of Carburetor	Starting System Size of Plenum Chambers per cyl.	Transmission Type	Front Axle Make Taper Axle	High Gear Ratio Taper Tires	Governor Make on Tires	Pr. Cent of Weight on Tires	
Buick	O	C	Delc	FS	C	B	3 1/4 Flat	106	31x4*	31x4*



Corliss, 1000-lb. Stake Body, \$785.
Also Express, \$765; Panel, \$795. The Corliss
Motor Truck Co., Corliss, Wis.

Studebaker, SF, 1000-lb. Panel, \$985.

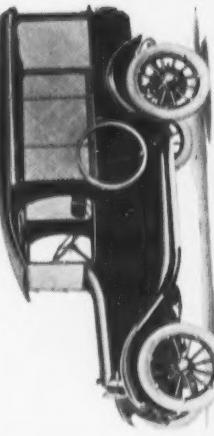
Also Station Car, \$985; Open Express, \$960.
Studebaker Corp. of America, South Bend, Ind.

1000 Pound Gasoline Commercial Cars

Name and Model Number a. c.	Chassis Weight	Engine Price	Chassis Price	Engine Make L-Roi	Chassis Make L-Roi	Bore and Stroke 3 1/2 x 4 1/2	Horse Power 15.6	No. of Cylinders 4	Valve Location Size of Plenum Chambers per cyl.	Transmission Type	Front Axle Make Dixie	High Gear Ratio Dixie	Governor Make on Tires	Pr. Cent of Weight on Tires
Corliss	1150	715	1150	L-Roi	L-Roi	3 1/2 x 4 1/2	15.6	4	....	T	T	4.5-1	103	31x4*
Dodge	1975	785	1975	Owens	Owens	3 1/2 x 4 1/2	24.1	4	....	T	T	4.2-1	114	31x4*
Studebaker	2300	765	2300	L-Roi	L-Roi	2 1/2 x 3 1/2	20	4	....	T	T	5.5-1	106	20x23*

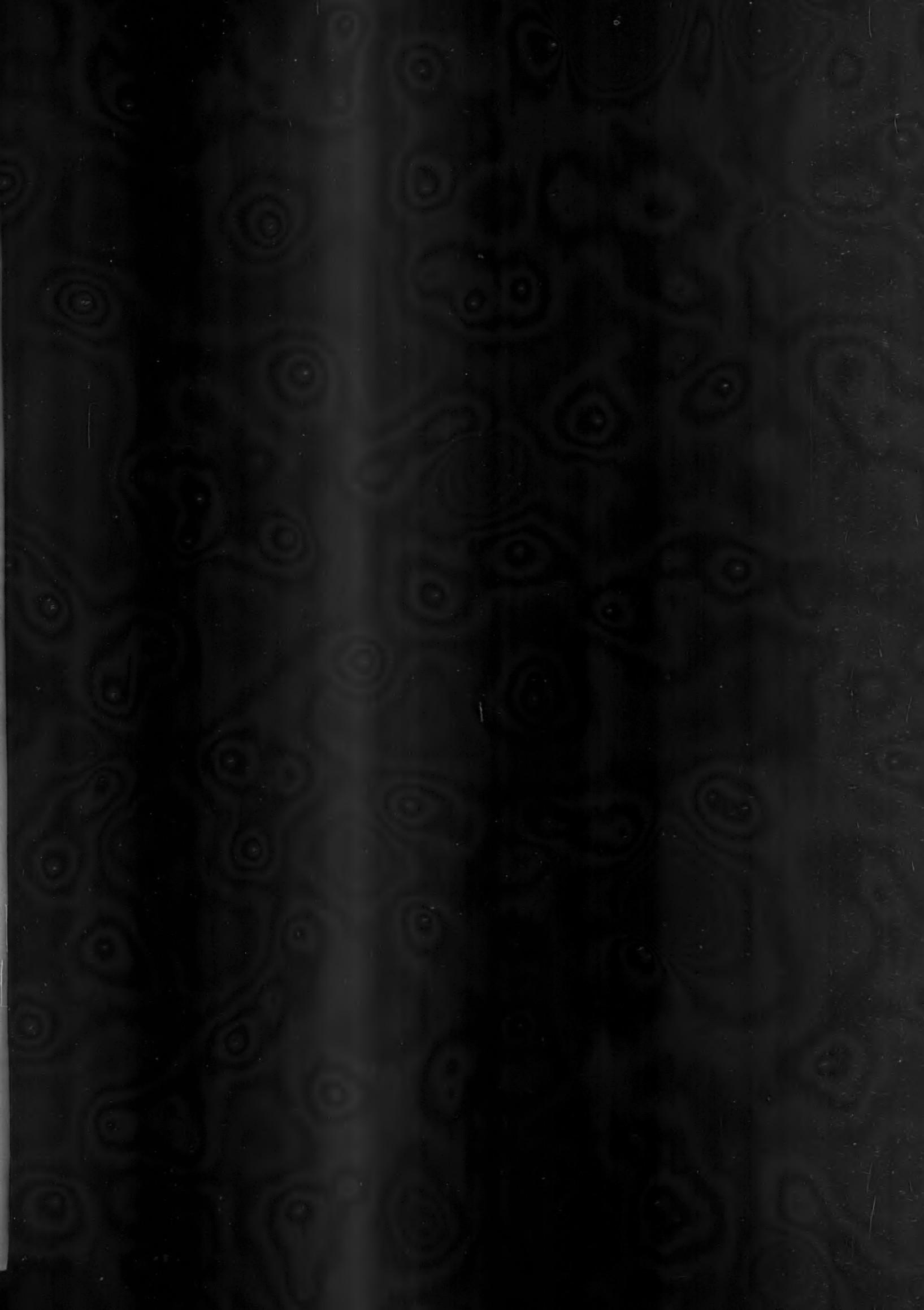


Dodge Screen Side Express, Chassis, \$785.
Dodge Bros., Detroit, Mich.



This is the second or last half of the Buyers' Information Commercial Car Review.

LAST HALF OF REVIEW. FIRST HALF WAS IN THE JANUARY ISSUE

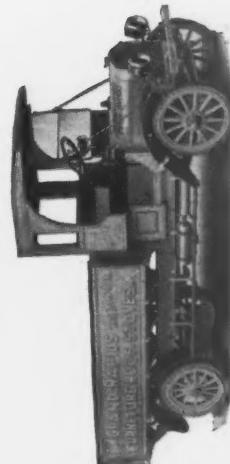






G. M. C. Model 16, 1500-lb. Chassis, \$1395.
Also Open Flareboard, \$1485; Screen Side Express, \$1335.

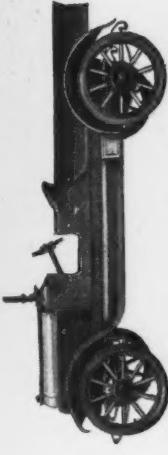
General Motors Truck Co., Pontiac, Mich.



Menominee Model EW, 1500-lb. Express Chassis, \$1650.
Menominee Motor Truck Co., Menominee, Mich.



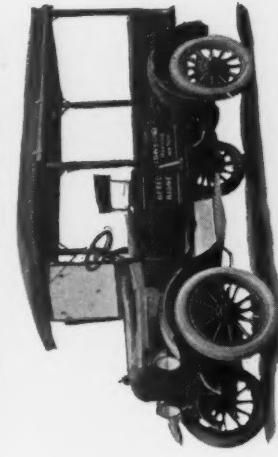
Republic Special, 1500-lb. Chassis, \$985.
Republic Motor Truck Co., Alma, Mich.



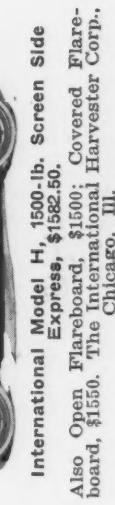
Dispatch Model G, 1500-lb. Convertible, \$1150.
Also Stake, \$1150; Open Flareboard, \$1150;
Panel, \$1225; Screen Side Express, \$1225; Cov-
ered Flareboard, \$1200; Express, \$1250.
Dispatch Motor Car Co., Minneapolis, Minn.



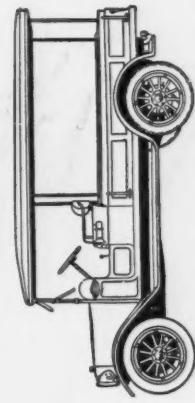
Kissel Flyer, 1500-lb. Open Flareboard, \$1335.
Also Panel, \$1510; Screen Side Express, \$1385.
Kissel Motor Car Co., Hartford, Wis.



Republic Dispatch, 1500-lb. Express Body and Canopy Top, \$895.
Also Panel, \$920. The Republic Motor Truck Co., Alma, Mich.



International Model H, 1500-lb. Screen Side Express, \$1582.50.
Also Open Flareboard, \$1500; Covered Flare-
board, \$1550. The International Harvester Corp.,
Chicago, Ill.



Reo Model F, 1500-lb. Covered Flareboard, \$1125.
Reo Motor Car Co., Lansing, Mich.

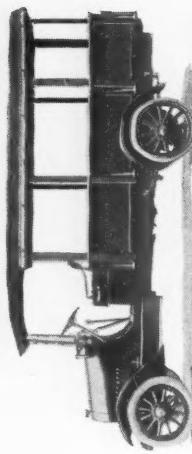


Menominee Model H, 1500-lb. Chassis, \$1650.
Menominee Motor Truck Co., Menominee, Mich.

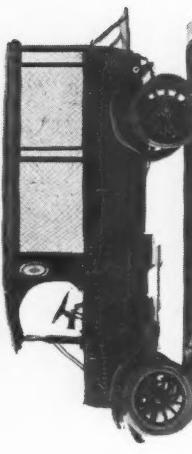
1500 Pound Gasoline Commercial Cars

Name and Model Number	G. C.	Chassis Weight	Chassis Price	Engine Make	Horse Power	No. of Cylinders	Piston Rims per cyl.	Size of Piston Rims	Valve Location	How Cooled	Name of Radiator	Starting System	Drive	Clinch: C, Cone: D, Disk: B, Band: E	Rear Axle Make	Wheelbase	Front Tires	Rear Tires	Governor Make	Pr. Cent of Weight on Rear Wheels
Dispatch G	2100	1100	Wis 2 3/4 x 5	22.5	4	3	1 1/4	L	T	H	Rayf Delc	USL	D	C	Own	3 Dead	4-1	120	34x4*	50
G. M. C. 16	2760	1350	Cont 3 1/2 x 5	22.5	4	3	1 1/4	L	C	T	Mar Eism	FS	B	3 Select	3 WestM	6-1	132	34x4*	67	
International H	2600	1450	Own 3 1/2 x 5 1/4	19.6	4	3	1 1/4	L	C	T	Holl Dix	FS	D	3 Select	3 Dead	7-1	116	35x5*	75	
Kissel	3050	1185	Own 3 1/2 x 5 1/2	24.1	4	3	1 1/4	L	C	T	Strm Eism	FS	C	3 SB	3 Warn	W	36x3 1/2	36x3 1/2	75	
Menominee-EVW	2525	1050	Cont 3 1/2 x 5	22.5	4	3	1 1/4	L	C	T	Strm Eism	FS	D	3 SB	3 Opt	3 1/2 Plot	4-6-1	32x4*	80	
Reo F	2620	895	Own 4 1/2 x 5 1/2	27.2	4	3	1 1/4	L	C	T	John Remy	Sp	D	3 SB	3 Selec	3 Plot	6-1	34x3 1/2	63	
Republic-Dis.			Own 3 1/2 x 5	16.9	4	3	1 1/4	L	C	T	Mar Eism	FS	D	3 Opt	3 Opt	3 Plot	6-1	34x4 1/2*	63	
Republic-Sp.			Own 3 1/2 x 5	16.9	4	3	1 1/4	L	C	T	Mar Eism	FS	D	3 Opt	3 Opt	3 Plot	6-1	34x4 1/2*	60	

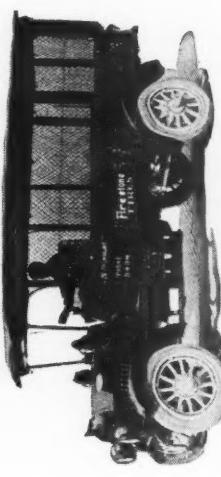
LAST HALF OF REVIEW. FIRST HALF WAS IN THE JANUARY ISSUE



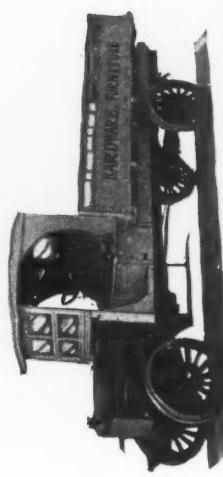
Chevrolet, 1-ton Covered Flareboard, \$1320.
Chevrolet Motor Co., Flint, Mich.



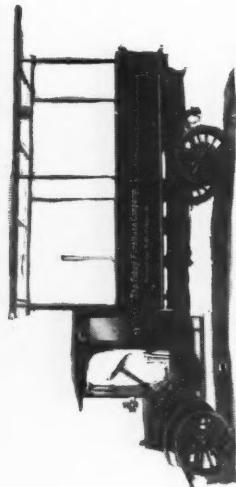
Dart Model E, 1-ton Screen Side Express, \$1850.
Dart Motor Truck Co., Waterloo, Ia.



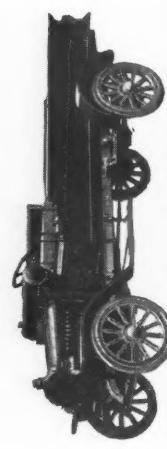
Federal Model S, 1-ton Screen Side Express
Chassis, \$1750.
Federal Motor Truck Co., Detroit, Mich.



Globe Model A, 1-ton Express, Chassis, \$1425.
Globe Motor Truck Co., St. Louis, Mo.



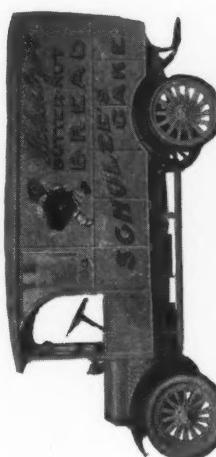
Available 1-ton Express, Chassis, \$1850.
Available Truck Co., Chicago, Ill.



Denby Model 12, 1-ton Open Flareboard, \$1490.
Also Stake, \$1560; Panel, \$1725; Screen Side
Express, \$1628. The Denby Motor Truck Co.,
Detroit, Mich.



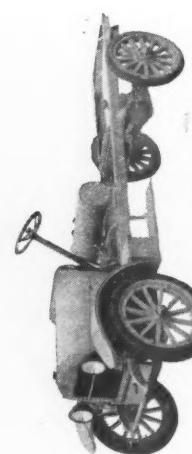
Diamond T, 1-ton Stake, Chassis, \$2000.
Diamond T Motor Car Co., Chicago, Ill.



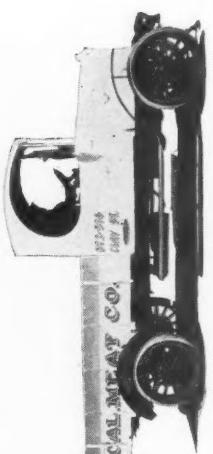
Gary Model F, 1-ton Panel.
Gary Motor Truck Co., Gary, Ind.



Acme Model B, 1-ton Open Flareboard, \$1850.
Also Stake, \$1860. The Acme Motor Truck Co.,
Cadillac, Mich.



The Comet, 1-ton Chassis.
Comet Automobile Co., Decatur, Ill.



De Martini Model A-17-W, 1-ton Flareboard
Chassis, \$1000.
De Martini Motor Truck Co., San Francisco, Cal.

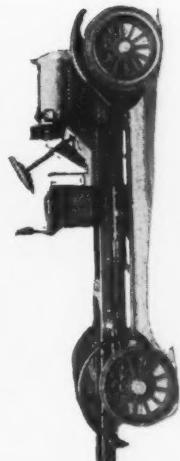


Ford Model T, 1-ton Chassis, \$600.
Ford Motor Co., Detroit, Mich.

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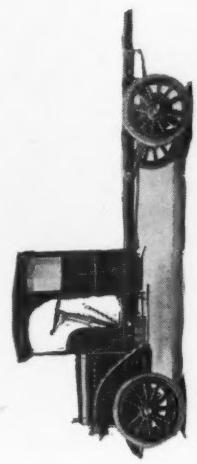
G. M. C. Model 21, 1-ton Chassis, \$1950.
General Motors Truck Co., Pontiac, Mich.



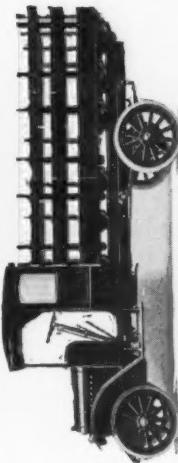
Little Giant, Model 15, 1-ton Chassis, \$1700.
Chicago Pneumatic Tool Co., Chicago, Ill.



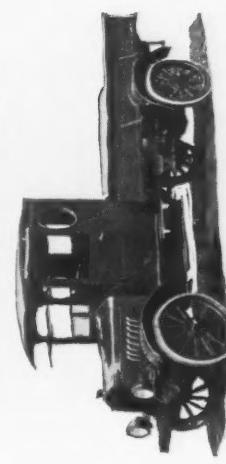
Nelson Model E1, 1-ton Panel, \$1700.
Nelson & Le Moon, Chicago, Ill.



International Model F, 1-ton Flareboard, \$1825.
Also Screen Side Express, \$1920; Covered Flareboard, \$1585. The International Harvester Corp., Chicago, Ill.



Maxwell 1-ton Stake, Chassis \$985.
Also Panel, Maxwell Motor Co., Detroit, Mich.



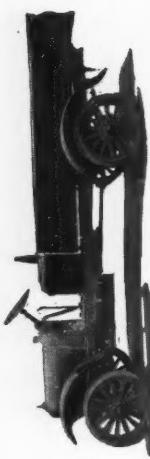
Nash 2017, 1-ton Chassis, \$1495.
Nash Motors Co., Kenosha, Wis.

Menominee Model FW, 1-ton Flareboard Chassis, \$1885.
Menominee Motor Truck Co., Menominee, Mich.

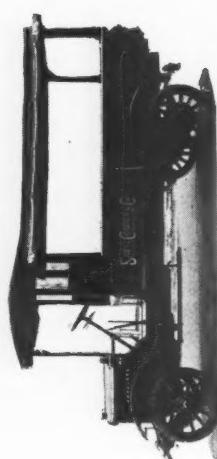
1 Ton Gasoline Commercial Cars

a. c.	Name and Model Number	Chassis Weight	Engine Make	Horse Power	Bore and Stroke	No. of Cylinders	Piston行程 per Cy.	Stroke of Piston Rods	Valve Location	Name of Radiator	Carburetor	Inletting System	Lubrication	Duct, Disk; C, Band; D, Clutch; B, Bands	Transmission	No. of Speeds	Gear Ratio	Wheelbase	Front Tires	Rear Tires	Governor Make	P.C. of Rear Wheel	
A-ome B Available	3200 1750	Cont	Rayf	3	3 1/2 x 5	4	3	1/4	L	Lng	Cott	3	Tink	7.8-1	130	34x3	34x4	Pier	85				
Chevrolet Comet	3560 1125	Cont	Sp	3	3 1/2 x 5 1/4	4	3	1/4	O	Sturm	Prog	3	1/2 F1ot	7.5-1	122	36x4	36x4	Pier	80				
Commerce E Dart, E	2900 3270	Own	Au-L	3	3 1/2 x 5 1/4	22.5	4	3	1/4	H	Selec	3	1/2 F1	7.5-1	125	31x4	32x4	Mon	60				
DeM'tini A17W Denby 12	1340 1550 1000 1460	Own	Dyn	3	3 1/2 x 5 1/4	16.9	4	3	1/4	C	Selec	3	1/2 F1	7.1	130	33x4	33x4	Pier	67				
Diamond T-J5	3055 1725	Cont	Remy	3	3 1/2 x 5 1/4	19.6	4	3	1/4	H	Selec	3	1/2 F1ot	7.8-1	126	34x3 1/2	34x3 1/2	Pier	85				
Federal S Ford T	3860 1750 600	Own	Wili	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Selec	3	1/2 F1	7.8-1	130	34x3 1/2	34x3 1/2	Mon	75				
Gary F Globe A-1	3200 3000 1425	Opt	Eism	3	3 1/2 x 5 1/4	22.5	4	3	1/4	H	Selec	3	1/2 F1	7.8-1	124	34x3 1/2	34x3 1/2	Mon	70				
GMC-21 Internat. F	3794 1950 1750	Cont	Bosh	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Selec	3	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Own	94				
Little Giant	2950	Own	Mill	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Plan	2	1/2 F1ot	7.1	132	36x3	36x3	Opt	***				
Maxwell	2400 3750	Own	Eism	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Plan	2	1/2 F1ot	7.3-1	124	30x3 1/2	30x3 1/2	Mon	66				
Monroe'see FW	3400 3000 2750	Cont	Holl	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	130	36x3 1/2	36x3 1/2	Own	80				
Nash 2017	3400 2750 3785	Cont	Sheb	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Mon	80				
Oneida-A	3785 2000	Cont	K-D	3	3 1/2 x 5 1/4	21	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Own	80				
			Eism	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	130	36x3 1/2	36x3 1/2	Opt	80				
			Holl	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			Sheb	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			K-D	3	3 1/2 x 5 1/4	21	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Eism	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			Holl	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Sheb	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			K-D	3	3 1/2 x 5 1/4	21	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Eism	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			Holl	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Sheb	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			K-D	3	3 1/2 x 5 1/4	21	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Eism	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			Holl	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Sheb	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			K-D	3	3 1/2 x 5 1/4	21	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Eism	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			Holl	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Sheb	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			K-D	3	3 1/2 x 5 1/4	21	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Eism	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			Holl	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Sheb	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			K-D	3	3 1/2 x 5 1/4	21	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Eism	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			Holl	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Sheb	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			K-D	3	3 1/2 x 5 1/4	21	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Eism	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			Holl	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Sheb	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			K-D	3	3 1/2 x 5 1/4	21	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Eism	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			Holl	3	3 1/2 x 5 1/4	22.5	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	124	36x3 1/2	36x3 1/2	Opt	80				
			Sheb	3	3 1/2 x 5 1/4	19.6	4	3	1/4	T	Plan	2	1/2 F1ot	7.8-1	128	36x3 1/2	36x3 1/2	Opt	80				
			K-D	3	3 1/2 x 5 1/4	21	4	3	1/4	T	Plan	2	1/2 F1ot										

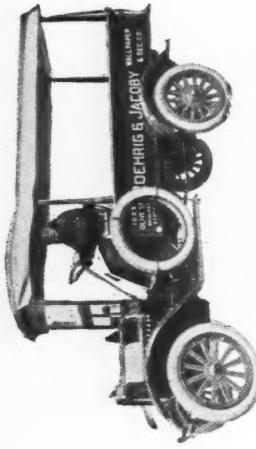
FEBRUARY 15, 1918



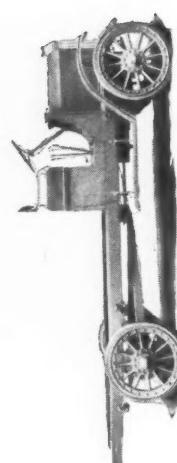
Republic Model 10, Open Stake, \$1195.
Also Stake, \$2095; Covered Flareboard, \$1195.
Republic Motor Truck Co., Inc., Alma, Mich.



Service 220, 1-ton Covered Flareboard, \$2150.
Also Stake, \$2095; Open Flareboard, \$2070;
Panel, \$2190.
Service Motor Truck Co., Wabash, Ind.



Palmer 1-ton Express, Chassis, \$1560.
Palmer-Meyer Motor Car Co., St. Louis, Mo.



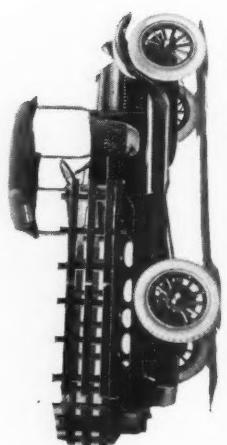
Universal Model G, 1-ton Chassis.
Universal Service Co., Detroit, Mich.



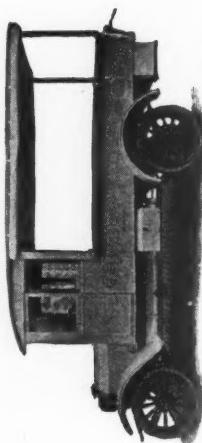
Panhard Model A, 1-ton Stake, \$1034.
Also Open Flareboard, \$1065; Covered Flareboard, \$1080.
The Hamilton Motor Co., Grand Haven, Mich.



Sandow Model K, 1-ton Stake, \$1450.
Sandow Motor Truck Co., Chicago, Ill.



Studebaker No. 7, 1-ton Stake, \$1450.
Studebaker Corp. of America, South Bend, Ind.

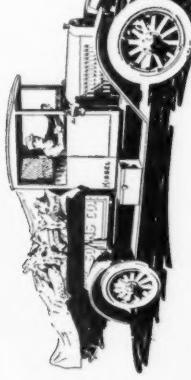


Wilcox Trux Model S, 1-ton Covered Flareboard, \$1800.
H. E. Wilcox Motor Co., Minneapolis, Minn.

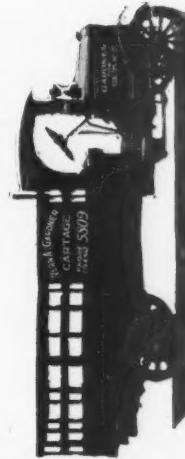
1 Ton Gasoline Commercial Cars

Name and Model Number	G. C.	Chassis Weight	Chassis Price	Engine Make	Bore and Stroke	Horse Power	No. of Cylinders	Plastomatics per Cy.	Stake-on Rides	Value Location	How Cooled	Carburetor	Injection System	Clutch: D, Disk; C, Cone; B, Band	No. of Speeds	Front Tires	Rear Tires	Governor Make	Pr. Cent of Weight on Rear Wheels					
Palmer	3150	1560	Cont	4 1/8 x 5 1/4	.27.2	4	3	1 1/2	L	C	Fed	Strm	Bosh	Au-L	Sp	D	I	Torb	6 1/2 - 12.2	34x4*	34x4*	Pier	70	
Panhard-A	3225	795	Gray	3 1/2 x 5	.19.6	4	3	1 1/2	O	T	Per	Strm	Conn	Bosh	FS	D	I	Torb	6 1/2 - 12.4	32x3 1/2	32x3 1/2	Rug	60	
Republic 10	2920	...	Cont	3 1/6 x 5	.19.6	4	3	1 1/2	T	T	Per	Strm	Bosh	Opt	FS	D	I	Flot	7-1	3x3	3x4	...	80	
Sandow A	2950	...	Cont	3 1/2 x 5	.19.6	4	3	1 1/2	T	T	Per	Strm	Eism	Eism	Opt	D	W	Full	6 1/2 - 12.0	32x3	34x4	...	65	
Service 220	3350	1500	Buda	3 1/2 x 5 1/8	.19.6	4	4	1 1/2	T	T	Per	Strm	Eism	Will	SP	C	B	Full	6 1/2 - 12.5	35x5*	35x5*	Pier	60	
Studebaker 7	2700	1300	Own	3 1/2 x 5	.24.1	4	4	1 1/2	L	L	Per	Strm	Eism	Hea	Wgt.	Fo	C	V	Flot	5-1	34x3 1/2	34x5	Mon	70
Universal G	4500	1800	Own	3 1/4 x 5 1/2	.22.5	4	3	1 1/2	L	L	Per	Strm	Eism	Opt	SP	C	C	Covt	3	34x3	34x3	...	61 1/2	
Wichita A	3520	1800	Own	3 1/2 x 5	.19.6	4	3	1 1/2	L	L	Per	Strm	Eism	Dead	SP	D	W	Shield	7-1	36x3	36x4	Pier	63	
Wichita K	3650	1800	Own	3 1/6 x 5	.19.6	4	3	1 1/2	L	L	Per	Strm	Eism	Opt	SP	D	W	Shield	6 1/2 - 12.8	Opt	Opt	Pier	80	
Wilcox Trux S	2800	...	Cont	3 3/4 x 5	.22.5	4	4	1 1/2	L	L	Per	Strm	Eism	Opt	SP	D	W	Shield	6 1/2 - 12.8	80	

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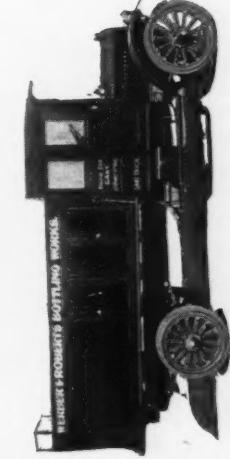


Kissel General Utility, 1 1/4-ton Flareboard. \$1735.
Also Covered Flareboard, \$1755; 12-passenger
Bus, \$2555. The Kissel Motor Car Co., Hartford,
Wis.



Acason Model B, 1 1/2-ton Stake, Chassis, \$2100.
Acason Motor Truck Co., Detroit, Mich.

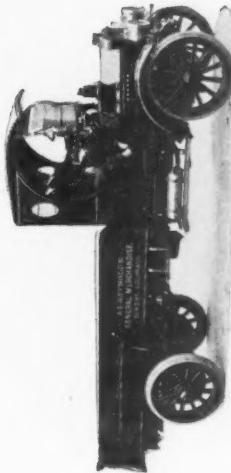
Federal T, 1 1/2-ton Open Flareboard, \$2200.
Federal Motor Truck Co., Detroit, Mich.



Gary Model G, 1 1/2-ton Bottlers' Body.
Gary Motor Truck Co., Gary, Ind.



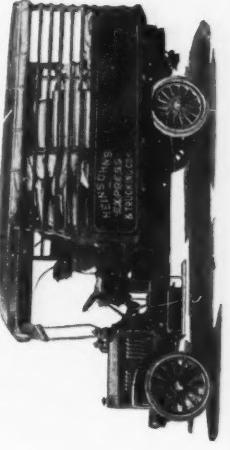
Signal Model F, 1/4-ton Chassis, \$1875.
Signal Motor Truck Co., Detroit, Mich.



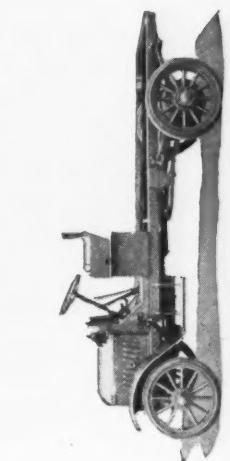
Federal T, 1 1/2-ton Open Flareboard, \$2200.
Federal Motor Truck Co., E. St. Louis, Ill.



Diamond T, J4, 1 1/2-ton Express, Chassis, \$2425.
Diamond T Motor Car Co., Chicago, Ill.



Globe Model B, 1 1/2-ton Express, Chassis, \$1750.
Globe Motor Truck Co., E. St. Louis, Ill.

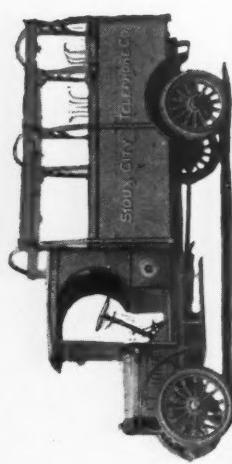


G. M. C. 1 1/2-ton Chassis, \$2350.
General Motors Truck Co., Pontiac, Mich.

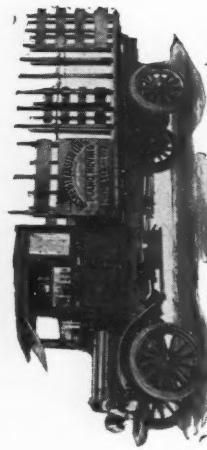
1 1/4 Ton Gasoline Commercial Cars

Name and Model Number	a. c.	Chassis Weight	Engine Make	Bore and Stroke	Horse Power	Valve Location	Size of Piston Rings	No. of Cylinders	Piston Rings per Cyl.	How Cooled	Name of Radiator	Leathering System	Drive	Rear Axle Make	Front Base	Rear Tires	Governor Make	Front of Weight on Rear Wheels					
Kissel Signal F	3500 4000	1585 1875	Own Cont	3 7/8 x 5 1/2 3 3/4 x 5 1/4	24.1 22.5	4 4	2 3	1 1/4 1 1/4	L L	C C	Fed Sturm	Eism Eism	FS FS	C D	Warn Selec	3 4	Shield Timk	6.5-1 7.8-1	152 144	34x3 34x3 1/2	34x4 36x5	Pier Mon	7/15 8/15
Acason	4430	2100	Wauk	3 3/4 x 5 3/4	22.5	4	3	1 1/4	L	T	Sturm	Eism	Sp	D	Covt	3	Timk	7.8-1	150	34x3 1/2	34x6	***	**
Diamond T, J4	3715	2425	Cont	3 3/4 x 5	22.5	4	3	1 1/4	L	P	Mill	Bosh	... F.O.	D	W	W	Opt	8.5-1	144	36x3 1/2	36x5	Simp	6/6
Federal T	4439	2240	Own	3 3/4 x 5 1/2	22.5	4	3	1 1/4	L	C	Zen	Eism	... Sp	D	W	W	Selec	8.5-1	144	36x3 1/2	36x5	Simp	7/3
Gary G	4200	1750	Buda	4 1/2 x 5 1/2	28.9	4	3	1 1/4	L	C	Pier	Mast	... Sp	D	W	W	Covt	8.1	144	36x3 1/2	36x5	Pier	7/4
Globe B	3600 ...	1550 2350	Cont	3 3/4 x 5 1/2	22.5	4	3	1 1/4	L	C	Mar	Eism	... Sp	D	W	W	Selec	9.3-1	144	36x3 1/2	36x5	Mon	7/4
GMC	...	2350	Cont	3 3/4 x 5	22.5	4	3	1 1/4	L	C	Timk	Eism	... F.S.	D	W	W	36x3 1/2	36x5	...	**

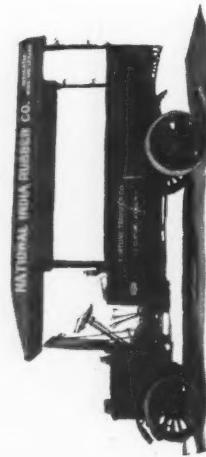
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Hawkeye Model J, Special Panel, Chassis, \$1750.
Also Stake, \$1875; Open Flareboard, \$1830;
Covered Flareboard, \$1925.
Hawkeye Mfg. Co., Sioux City, Ia.



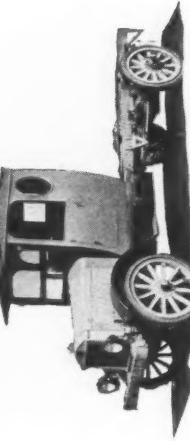
Menominee H, 1/2-ton Stake, Chassis, \$2190.
Menominee Motor Truck Co., Menominee, Mich.



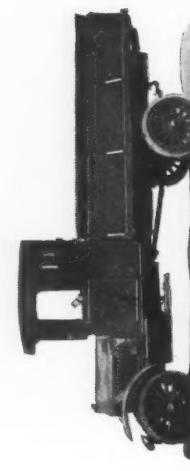
Northwestern Model W, 1/2-ton Express, \$2650.
Starr Carriage Co., Seattle, Wash.



Moreland 17B, 1/2-ton Chassis, \$2650.
Moreland Motor Truck Co., Los Angeles, Cal.



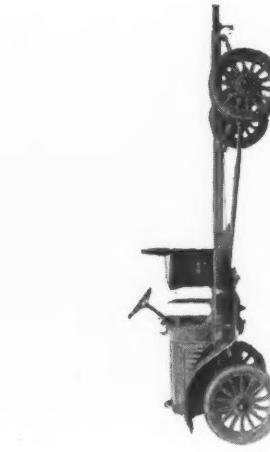
Oneida Model B, 1/2-ton Chassis, \$2650.
Oneida Motor Truck Co., Green Bay, Wis.



Panhard B, 1/2-ton Open Flareboard, \$1105.
Also Stake, \$1134; Covered Flareboard, \$1180.
Hamilton Motor Co., Grand Haven, Mich.



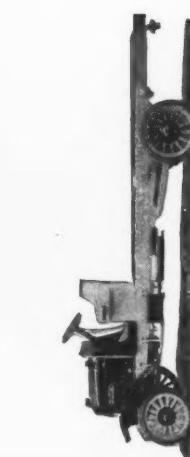
Packard Model 1-E, 1/2-ton Panel, \$2450.
Packard Motor Car Co., Detroit, Mich.



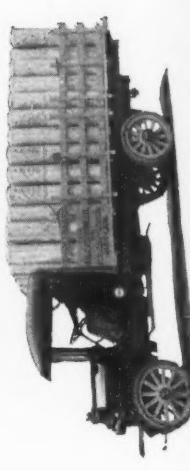
Republic Model 11, 1/2-ton Chassis, \$1450.
Republic Motor Truck Co., Inc., Alma, Mich.



Service 230, 1/2-ton Tank Body, Chassis, \$2550.
Also Stake, \$2785; Open Flareboard, \$2740; Pan-
el, \$2900; Covered Flareboard, \$2850.
Service Motor Truck Co., Wabash, Ind.



Signal Model H, 1/2-ton Chassis, \$2375.
Signal Motor Truck Co., Detroit, Mich.



Velle Model 25-A, 1/2-ton Stake, Chassis, \$2750.
Velle Motors Corp., Chicago, Ill.

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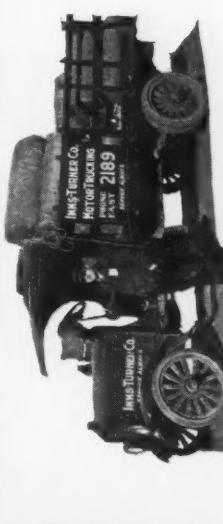
Wilcox Trux, 1/2-ton Hydraulic Hoist Dump.
H. E. Wilcox Motor Co., Minneapolis, Minn.

1½ Ton Gasoline Commercial Cars

Name and Model Number	G. c.	Chassis Weight	Chassis Price	Engine Make	Bore and Stroke	Horse Power	No. of Cylinders	Platen Hinges per Cy'l.	Valve Location	How Cooled	Name of Radiator	Lubrication System	Transmission	No. of B'heads	Drive	Rear Axle Make	High Gear Ratio	Front Tires	Rear Tires	Governor Make	Pr. Cent of Weight on Rear Wheels	
Hawkeye J-B	2150	1750	Buda	3 1/4 x 5 1/8	22.5	4	4	1 1/2	T	C	T	Fo	D	I	Select	Cel	7-1	136 1/2	34x3 1/2	Dup	68 1/2	
Moreland 11-B	3685	2950	Cont	4 1/8 x 5 1/4	22.5	4	3	1 1/2	T	C	T	Fo	D	W	Opt	Timk	7-1	136 1/2	34x3 1/2	Dup	68 1/2	
Menominee H	4000	2800	Cont	3 3/8 x 5 1/4	22.5	4	3	1 1/2	T	C	T	Fo	D	W	Opt	Timk	9-3-1	36x5	36x5	Own	80	
Northwestern W	4150	2850	Cont	4 1/8 x 5 1/4	27.2	4	3	1 1/2	T	C	T	Fo	D	W	Covt	Timk	7-8-1	140	36x5	36x5	Own	80
Oneida, B	2650	2650	Cont	4 1/8 x 5 1/4	27.2	4	3	1 1/2	T	C	T	Fo	D	W	Covt	Timk	9-3-1	130	36x3 1/2	36x3 1/2	Dup	80
Packard 1-E	4500	2450	Own	4 x 5 1/2	25.6	4	3	1 1/2	O	O	O	Fo	D	I	Selec	Timk	6-3-1	126	34x3 1/2	34x6	C	64
Painard B	3485	1955	Gray	3 1/2 x 5	19.6	4	3	1 1/2	O	O	O	Fo	D	I	Full	Torb	8-1	120	32x3 1/2	32x4	Timk	70
Republic 11	3211	1450	Cont	3 9/16 x 5	22.5	4	3	1 1/2	O	O	O	Fo	D	I	Selec	Timk	8-1	144	32x3 1/2	34x5	Rugg	60
Sandow B	3300	2200	Cont	3 1/2 x 5	19.6	4	3	1 1/2	O	O	O	Fo	D	W	Opt	Timk	6-5-1	120	34x4	34x4	Timk	80
Service 230	4525	2375	Buda	4 x 5 1/2	25.6	3	3	1 1/2	C	C	C	Fo	D	W	B-Lipe	Timk	7-8-1	50	36x3 1/2	36x5	Simp	66
Signal H	4475	2550	Cont	4 1/8 x 5 1/4	27.2	4	3	1 1/2	C	C	C	Fo	D	W	B-Lipe	Timk	9-3-1	44	36x6	36x6	Mon	85
Velle 25A	4100	2100	Own	3 1/2 x 5	19.6	4	3	1 1/2	C	C	C	Fo	D	W	Selec	Timk	7-8-1	50	36x7	36x7	Pier	85
Wichita L	4200	...	Own	4 1/4 x 5	28.9	4	3	1 1/2	C	C	C	Fo	D	W	Covt	Timk	10-7-1	Opt	36x3 1/2	36x5	Pier	68
Wilcox Trux X	...	...	...	...	...	...	...	...	...	...	...	Sp	C	W	Selec	Timk	7-7-1	144	36x4	36x5	Pier	85

2 Ton Gasoline Commercial Cars

Acason Model A Available	4730	2400	Wauk	4 1/4 x 5 3/4	28.9	4	3	1 1/4	L	C	L	Sheb	D	W	Munc	Timk	7-8-1	150	34x4	36x4D	...	
Acason Model A Available	4450	2450	Cont	4 1/8 x 5 1/4	27.2	4	3	1 1/4	L	C	L	Rayf	D	W	Cott	Timk	9-3-1	148	36x4	36x6	Pier	85
Acason Model A Available	5450	2500	Cont	4 1/8 x 5 1/4	27.2	4	3	1 1/4	L	C	L	Rayf	D	W	Prog	Timk	7-5-1	156	36x5	36x5D	Pier	80
Acason Model A Available	4800	1860	Cont	4 1/8 x 5 1/2	36.1	4	3	1 1/4	L	C	L	Bosh	D	W	Selec	Dead	3-2	28	36x4	36x5D	Pier	70
Acason Model A Available	4000	1930	Cont	4 1/8 x 5 1/4	27.2	4	3	1 1/4	L	C	L	Shik	D	W	Full	Timk	9-5-1	144	34x3 1/2	36x6	Pier	75
Acason Model A Available	...	...	...	...	...	...	...	...	...	...	...	Fo	C	W	Covt	Timk	9-5-1	Opt	36x4	36x6	Pier	85



Acason 2-ton Stake, Chassis, \$2400.
Acason Motor Truck Co., Detroit, Mich.

Acme Model A, 2-ton Stake, \$2570.
Also Open Flareboard, \$2575; Combination Stake & Dump, \$3000.
Acme Motor Truck Co., Cadillac, Mich.

Beck C, 2-ton Oll Body, Chassis \$1860.
Beck Motor Truck Works, Cedar Rapids, Ia.

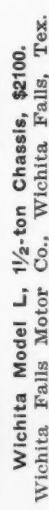


Columbia Model E, 2-ton Chassis, \$1950.
Columbia Motor Truck & Trailer Co., Pontiac, Mich.

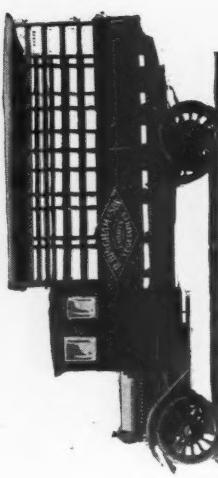
Avery Model B, 2-ton Open Flareboard.
Also Stake; Panel, Avery Co., Peoria, Ill.

Available, 2-ton Panel, Chassis, \$2650.
Available Truck Co., Chicago, Ill.

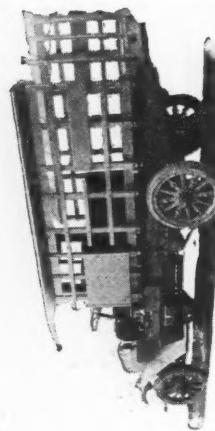
Wichita Model L, 1/2-ton Chassis, \$2100.
Wichita Falls Motor Co., Wichita Falls, Tex.



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De Martini Model C-17-W, 2-ton Stake, Chassis, \$2750.
De Martini Motor Truck Co., San Francisco, Cal.



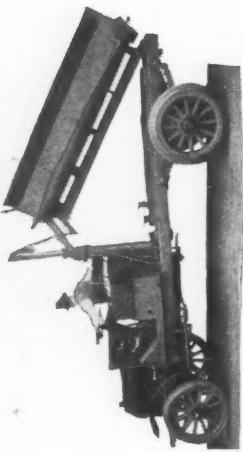
De Kalb Model E-2, 2-ton Stake, Chassis, \$2250.
Also Open Flareboard, \$2300.
De Kalb Wagon Co., De Kalb, Ill.



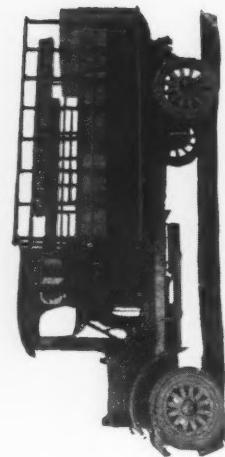
Dart Model CC4, 2-ton Express, Chassis, \$2650.
Dart Motor Truck Co., Waterloo, Ia.



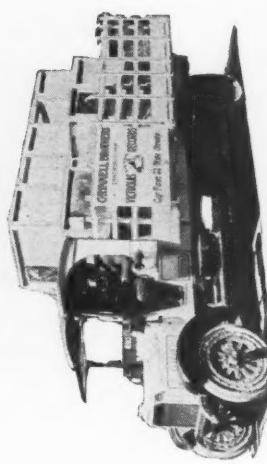
Denby 13, 2-ton Covered Stake, Chassis, \$2025.
Also Open Flareboard, \$2160; Screen Side Express, \$22300.
Denby Motor Truck Co., Detroit, Mich.



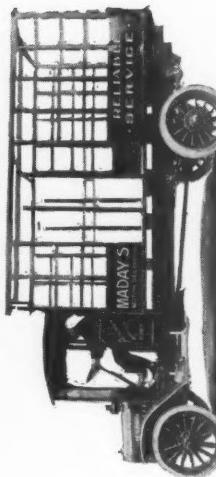
Diamond T, J3, 2-ton Stake, Chassis, \$2775.
Diamond T Motor Car Co., Chicago, Ill.



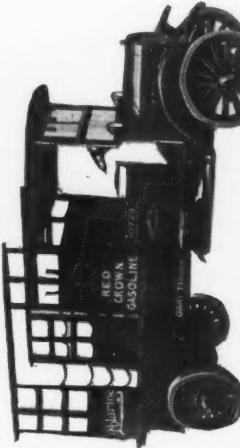
Fargo Model P, 2-ton Stake, Chassis, \$2375.
Also Open Flareboard, \$2325; Covered Flareboard, \$2400. Fargo Motor Car Co., Chicago, Ill.



Federal Model U, 2-ton Stake, Chassis, \$2450.
Federal Motor Truck Co., Detroit, Mich.



G. M. C. Model 41, 2-ton Stake, Chassis, \$2690.
General Motors Truck Co., Pontiac, Mich.



Gary Model H, 2-ton Stake, Chassis, \$2750.
Gary Motor Truck Co., Gary, Ind.

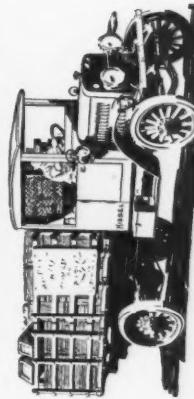


Globe Model C, 2-ton Panel, Chassis, \$2050.
Globe Motor Truck Co., St. Louis, Mo.





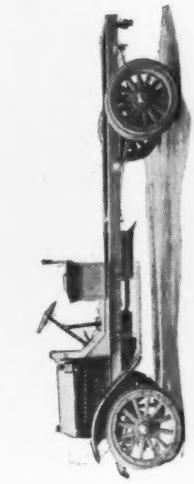
Hendrickson Model G, 2-ton Stake, Chassis, \$2250.
Hendrickson Motor Truck Co., Chicago, Ill.



Kissel Freighter, 2-ton Stake, Chassis, \$2250.
Also Special Combination Stake and Flare-board, \$2515.
Kissel Motor Car Co., Hartford, Wis.

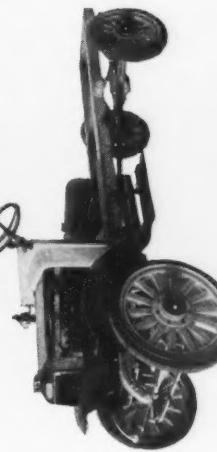


Nelson Model E2, 2-ton Stake, Chassis, \$2250.
Nelson & Le Moon, Chicago, Ill.

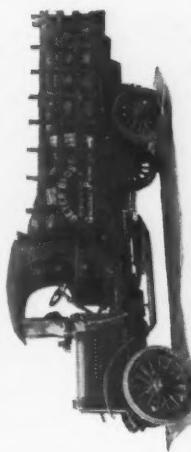


Menominee Model D, 2-ton Stake, Chassis, \$2615.
Menominee Motor Truck Co., Menominee, Mich.

Little Giant Model 16, 2-ton Chassis, \$2615.
Chicago Pneumatic Tool Co., Chicago, Ill.



Muskegon Model 20, 2-ton Stake, Chassis, \$1995.
Muskegon Engine Co., Muskegon, Mich.



Noble Model NW2, 2-ton Stake, \$2425.
Noble Motor Truck Co., Kendallville, Ind.

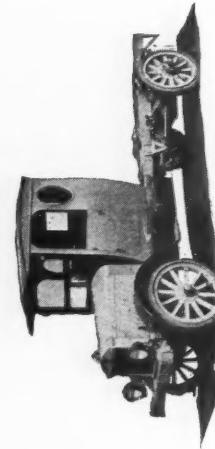
2 Ton Gasoline Commercial Cars

a. c.	Name and Model Number	Chassis Weight	Chassis Price	Engine Make	Bore and Stroke	Horse Power	No. of Cylinders	Piston行程es per Cy.	Valve Location	Seat of Piston Rods	Name of Carburetor	Name of Intake	Starting System	Lubrication System	Clutch; C, Cone; D, Disc; B, Band;	Drive	No. of Speeds	Rear Axle Ratio	Wheelbase	Front Tires	Rear Tires	Covered Make	P.C. cent of weight on Rear wheels
Dart CC-4	4865	2100	Buda	4 1/4 x 5 1/2	28.9	4	3	...	Eism	Mast	T Bus	T	Fo	D	W	Timk	8.5-1	150	36x4	36x7	Simp	85	
Dekalb E-2	4300	2100	Cont	4 1/4 x 5 1/2	27.2	4	3	...	Bosh	Strm	T Bus	T	Fo	D	W	Timk	134	36x3 1/2	36x5	36x6	Pier	70	
Dem'l Timl Cir-W	4550	2025	Buda	3 3/4 x 5 1/2	22.5	4	3	...	Eism	Zen	T Bus	T	Fo	D	W	Sheld	8.8-1	148	36x3 1/2	36x6	Mon	75	
Denby 12	3800	2025	Cont	3 3/4 x 5	22.5	4	3	...	Bosh	Mill	T Bus	T	Fo	D	W	Dead	9.8-1	144	36x3 1/2	36x6	Mon	..	
Diamond T-J-3	4150	2285	Cont	4 1/8 x 5 1/2	27.2	4	3	...	Mag	...	T Bus	T	Fo	D	W	Fiat	7.8-1	144	36x4	36x7	Mon	..	
Dorris K-4	4850	2285	Own	4 1/4 x 5 1/2	28.9	4	3	...	Strm	...	T Bus	T	Fo	D	W	Selec	3	144	36x4	36x7	Mon	70	
Dorris L-B-W	4800	2715	Own	4 3/8 x 5	30.6	4	3	...	Bosh	...	T Bus	T	Fo	D	W	Timk	7.8-1	144	36x4	36x7	Pier	70	
Fargo P	4200	2250	...	4 1/4 x 6 3/4	28.9	4	3	...	Eism	...	T Bus	T	Fo	D	W	Russ	9.5-1	140	36x4	36x6	Mon	88	
Federal U	4600	2450	Own	3 3/4 x 5 1/2	22.5	4	3	...	Dix	...	T Bus	T	Fo	D	W	Selec	4	156	36x4	36x6	Opt	66	
Gary H	4500	2050	Buda	4 1/4 x 5 1/2	28.9	4	3	...	Eism	...	T Bus	T	Fo	D	W	Sheld	9.3-1	156	36x4	36x6	Opt	66	
Globe C	4160	2690	Cont	4 1/6 x 5 1/2	27.2	4	3	...	Mar	...	T Bus	T	Fo	D	W	Covt	3	154	36x4	36x6	Pier	73	
GMC	...	2690	Cont	4 1/6 x 5 1/2	27.2	4	3	...	Eism	...	T Bus	T	Fo	D	W	Selec	4	154	36x4	36x6	Mon	74	
Hendrickson G	4550	2250	Wauk	4 1/4 x 5 1/2	28.9	4	3	...	Dix	...	T Bus	T	Fo	D	W	Timk	7.8-1	144	36x4	36x7	Own	75	
Kissel	4600	2715	Own	4 1/4 x 5 1/2	28.9	4	3	...	Strm	...	T Bus	T	Fo	D	W	Full	3	144	36x4	36x7	Pier	80	
Little Giant 16	4500	2275	Cont	4 1/4 x 5 1/2	28.9	4	2	...	May	...	T Bus	T	Fo	D	W	Munc	4	168	36x4	36x7	Mon	80	
Menominee D	4700	2615	Cont	4 1/2 x 5 1/2	27.2	4	3	...	Eism	...	T Bus	T	Fo	D	W	Warn	3	168	36x4	36x7	Own	92	
Muskegon 20	4080	1935	Cont	4 1/6 x 5 1/2	27.2	4	3	...	Sheb	...	T Bus	T	Fo	D	W	Cott	3	144	36x4	36x6	Pier	80	
Nash 3017	3550	1875	Own	3 3/4 x 5 1/2	22.5	4	3	..	Stew	...	T Bus	T	Fo	D	W	Torb	3	144	34x4	34x6	Mon	80	
Nash Quad	6000	2250	Buda	4 1/4 x 5 1/2	28.9	4	3	..	Delc	...	T Bus	T	Fo	D	W	Selec	3	124	36x5	36x7	Mon	85	
Nel & Le M.E2	4600	2300	Cont	4 1/6 x 5 1/2	27.2	4	3	..	Mag	...	T Bus	T	Fo	D	W	Fiat	7.8-1	144	36x4	36x7	Mon	80	
Noble NW-2	4600	2300	Cont	4 1/6 x 5 1/2	27.2	4	3	..	Strm	...	T Bus	T	Fo	D	W	Pier	3	148	36x4	36x6	Opt	80	

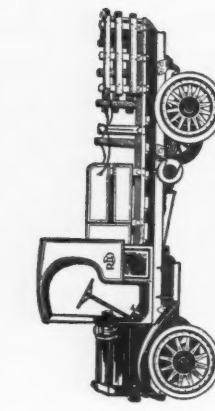
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Palmer 2-ton Stake, Chassis, \$2295.
Palmer-Meyer Motor Car Co., St. Louis, Mo.



Oneida Model C, 2-ton Chassis, \$3000.
Oneida Motor Truck Co., Green Bay, Wis.



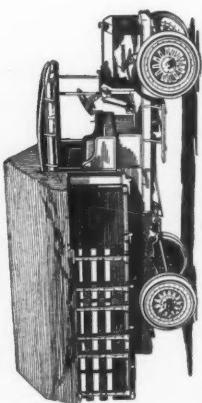
Reo Model J, 2-ton Stake, \$1950.
Also Open Flareboard, \$1980; Screen Side Express, \$2185. Reo Motor Car Co., Lansing, Mich.



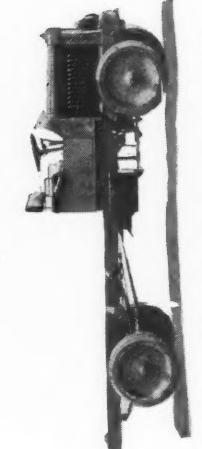
Sandow Model D, 2-ton Chassis.
Sandow Motor Truck Co., Chicago, Ill.



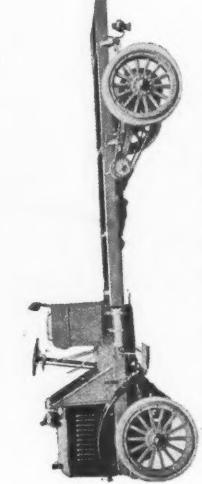
Service 240, 2-ton Open Flareboard, \$3000.
Also Stake, \$3110; Panel, \$3175; Covered Flareboard, \$3075. Service Motor Truck Co., Wabash, Ind.



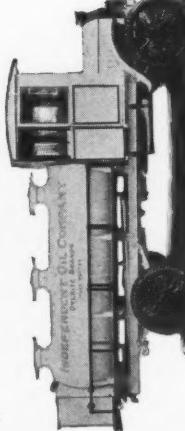
Standard Model 70, 2-ton Stake, \$2645.
Also Dump Bodies, \$2880, \$2882; Hydraulic Hoist, \$2730. Standard Motor Truck Co., Detroit, Mich.



Winther Model 47, 2-ton Chassis, \$3000.
Winther Motor Truck Co., Winthrop Harbor, Ill.



Wichita Model B, 2-ton Chassis, \$2500.
Wichita Falls Motor Co., Wichita Falls, Tex.



Wilson, 2-ton Stake, Chassis, \$2650.
J. C. Wilson Co., Detroit, Mich.



Republic Model A, 2-ton Chassis, \$1885.
Republic Motor Truck Co., Alma, Mich.

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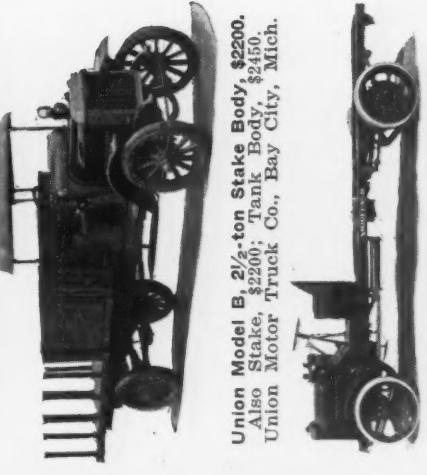
2 Ton Gasoline Commercial Cars

Ton Gasoline Commercial Cars											
Name and Model Number	a. g.	Chassis Weight	Chassis Price	Engine Make	Horse Power	Number of Cylinders	Positioning Cyl.	Value Location	Startling System	Lubrication	No. of Speeds
Oneida C	4525	3000	Cont	4 1/2 x 5 1/4	27.2	4	3	L	C	CC	10
Packard 1 1/2 E	4440	2800	Own	4 1/2 x 5 1/4	25.6	4	3	L	F	SD	10
Palmer	4200	2295	Cont	3 3/4 x 5 1/4	22.5	4	3	L	D	D	10
Reo J	4150	1850	Own	4 1/2 x 5 1/2	27.2	4	3	L	T	C	10
Republic A	4153	1855	Buda	3 3/4 x 5 1/2	27.2	4	3	L	T	D	10
Sandow D	4400	2500	Cont	4 1/4 x 5 1/2	22.5	4	3	L	T	D	10
Service 240	4900	2575	Buda	4 1/4 x 5 1/2	28.9	4	3	L	F	SD	10
Standard 70	4380	2575	Cont	4 1/4 x 5 1/4	27.2	4	3	L	P	D	10
Universal D	5400	2500	Own	4 1/2 x 5 1/4	25.6	4	3	L	F	SD	10
Wichita B	4700	2550	Own	3 1/2 x 5 1/4	19.6	4	3	L	F	SD	10
Wilcox Trux Q	4500	2550	Own	4 1/4 x 5 1/4	28.9	4	3	L	F	SD	10
Winther 47	5300	3000	Wis	4 1/4 x 5 1/4	27.2	4	3	L	F	SD	10
DeKalb E2 1/2	4900	2450	Cont	4 1/4 x 5 1/4	27.2	4	3	L	C	CC	10
Gary HU	4800	2850	Buda	4 1/4 x 5 1/2	28.9	4	3	L	F	SD	10
Gersix G	5000	2850	Buda	3 1/2 x 5 1/2	29.7	6	3	L	F	SD	10
Harvey WFA	5300	2850	Buda	4 1/4 x 5 1/2	28.9	4	3	L	D	D	10
Moreland 17C	4900	3375	Cont	4 1/4 x 5 1/2	32.4	4	3	L	T	C	10
Packard 2E	5100	3300	Own	4 2/3 x 5 1/2	25.6	4	3	L	F	SD	10
Signal J	5000	2835	Cont	4 3/4 x 5 1/4	27.2	4	3	L	F	SD	10
Union	4800	2975	Wauk	4 1/4 x 5 1/4	29.6	4	3	L	F	SD	10
Wichita R	4440	2700	Wis	3 3/4 x 5 1/4	22.5	4	3	L	F	SD	10

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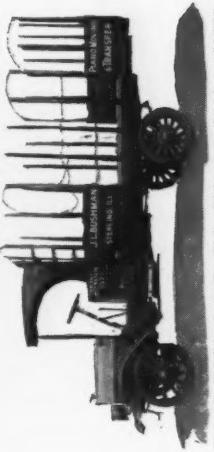
Harvey Model WFA, 2½-ton Tank Body.
Chassis, \$2850.
Harvey Motor Truck Co., Harvey, Ill.



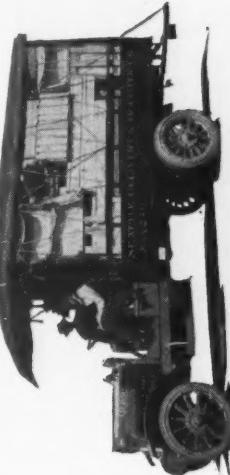
Union Model B, 2½-ton Stake Body, \$2200.
 Also Stake, \$2200; Tank Body, \$2450.
 Union Motor Truck Co., Bay City, Mich.



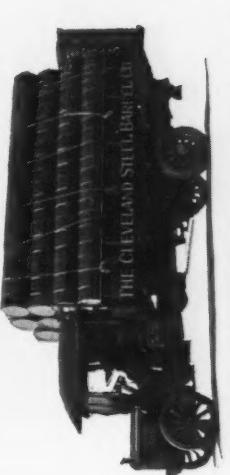
Gary Model H U, 2½-ton Special Body.
Gary Motor Truck Co., Gary, Ind.



De Kalb Model E, $\frac{2}{3}$, $\frac{2}{3}$ -ton Stake, \$2650.
Also Open Flareboard, \$2600.
De Kalb Wagon Co., De Kalb, Ill.



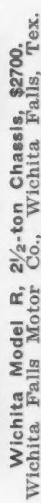
Gersix Model G, 2½-ton Covered Express, Chassis, \$2850.
Gersix Mfr. Co., Seattle, Wash.



Packard 2-E, 2½-ton Flareboard Chassis, \$3200.
Packard Motor Car Co., Detroit, Mich.

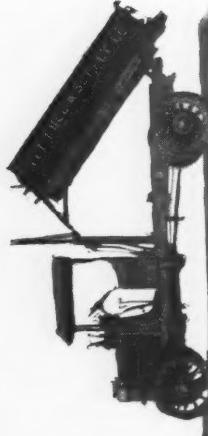


Signal Model J, 2-ton Chassis, \$2835.
Signal Motor Truck Co., Detroit, Mich.

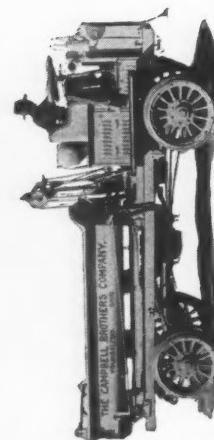


Moreland 17C, 2½-ton chassis, \$3375.
Moreland Motor Truck Co., Los Angeles, Cal.

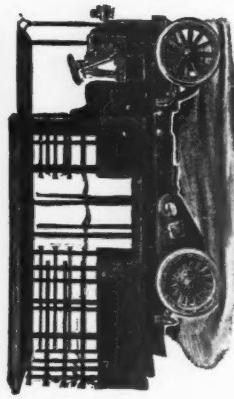
FEBRUARY 15, 1918



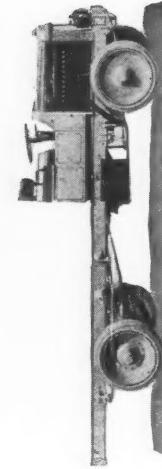
Union Model B, 2½-ton Dump Body, \$2675.
Also Stake, \$2200; Tank Body, \$2975.
Union Motor Truck Co., Bay City, Mich.



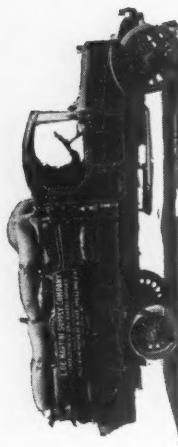
F. W. D. B., 3-ton Flareboard, Chassis, \$4000.
Four Wheel Drive Auto Co., Clintonville, Wis.



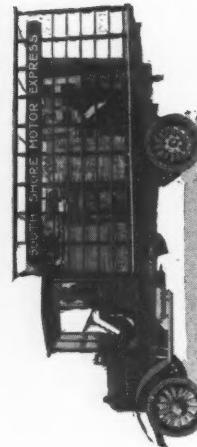
Avery, 3-ton Covered Stake.
Also Open Flareboard, \$2660;
Panel Avery Co., Peoria, Ill.



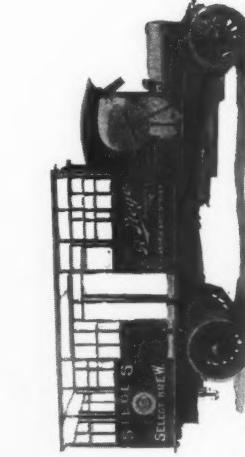
Winther Model 67, 3-ton Chassis, \$3600.
Winther Motor Truck Co., Winthrop Harbor, Ill.



De Martini E-17, 3-ton Stake, Chassis, \$3650.
De Martini Motor Truck Co., San Francisco, Cal.



Gary Model K, 3-ton Stake.
Gary Motor Truck Co., Gary, Ind.



Nelson E-3, 3-ton Special Stake, Chassis, \$2950.
Nelson & Le Moon, Chicago, Ill.



Denby 15, 3-ton Platform Body, Chassis, \$2625.
Also Stake, \$2685; Open Flareboard, \$2660;
Screen Side Express, \$2800.
Denby Motor Truck Co., Detroit, Mich.

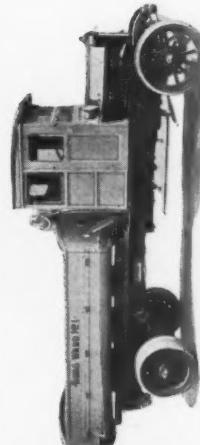
3 Ton Gasoline Commercial Cars

a. c.	Name and Model Number	Chassis Weight	Engine Make	Horse Power	No. of Cylinders	Stroke of Piston Rings per Cyl.	Valve Location	How Cooled	Name of Radiator	Lubricating System	Rear Axle Make	High Gear Ratio	Front Tires	Rear Tires	Governor Make	Pr. Cent of Weight on Rear Wheels
Avery B	6250	3200	...	4 3/8 X 5	36	4	C	T	Rayf	Eism	Dead	... 128	38x5	38x4D	...	70
Avery A	6200	2500	...	4 3/8 X 5	36	4	C	C	Rayf	Eism	Dead	... 140	36x7	36x7	...	75
De Martini E17W	6200	2500	Buda	4 1/2 X 5 1/2	28.9	4	D	D	B-Lipe	Bosh	Dead	... 140	36x4	36x4	Mon	65
Derby 15	4320	2225	...	3 3/4 X 5	22.5	4	T	T	Sturm	Zen	Dead	10.9-1	144	36x4	36x4	65
F. W. D.-B.	6400	4200	Wis.	4 3/4 X 5 1/2	36.1	4	T	T	Sturm	Eism	Select	8.9-1	124	36x6	36x6	Dop
Gary K	6500	2550	Buda	4 1/2 X 6	32.4	4	T	C	Sturm	Bosh	Opt.	8.8-1	124	36x6D	36x6D	Dop
Winther 67	6400	3600	Cont.	4 3/8 X 5 1/2	32.4	4	S	T	Wast	Eism	Opt.	10.1	160	36x5	36x5D	Dop
			Wis.	4 3/8 X 6	32.4	4	D	D	Sturm	Elsm	Prog.	10.1	160	36x4	36x4D	Dop

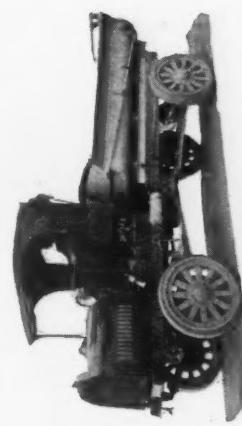
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Acason 3 1/2-ton Stake, Chassis, \$3000.
Acason Motor Truck Co., Detroit, Mich.



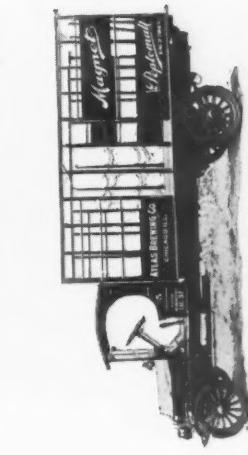
Diamond T, Model LB, 3 1/2-ton Dump Body,
Chassis, \$3650.
Diamond T Motor Car Co., Chicago, Ill.



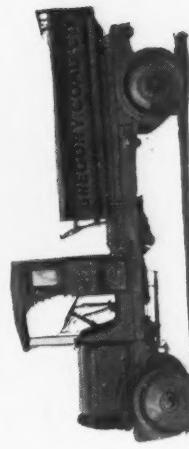
Duplex E, 3 1/2-ton Dump Body, Chassis, \$4000.
Duplex Truck Co., Lansing, Mich.



Acme Model C, 3 1/2-ton Combination Stake and Dump, \$3875.
Also Stake, \$3355; Open Flareboard, \$3390;
Dump with Hydraulic Hoist, \$3550.
Acme Motor Truck Co., Cadillac, Mich.



Available Model 3, 3 1/2-ton Stake, \$3650.
Available Truck Co., Chicago, Ill.



Dart L, 3 1/2-ton Coal Body, Chassis, \$3600.
Dart Motor Truck Co., Waterloo, Ia.



G. M. C. Model 71, 3 1/2-ton Chassis, \$3750.
General Motors Truck Co., Pontiac, Mich.

3 1/2 Ton Gasoline Commercial Cars

Name and Model Number	a. g.	Chassis Weight	Chassis Price	Engine Make	Bore and Stroke	Horse Power	Size of Pistons per Cylinder	Piston Rings per Cylinder	Valve Location	How Cooled	Name of Radiator	Carburetor	Starting System	No. of Speeds	High Gear Ratio	Wheelbase	Front Tires	Rear Tires	Covered Make	Front of Wheel
Acason	6300	3000	Wauk	4 1/4 x 5 1/2	28.9	4	3	1/4	L	C	Sheb	Eism	G&D	D	W	Munc	Opt	35x4	36x6D	Pier
Acme C	6500	3250	Cont	4 1/2 x 5 1/2	32.4	4	3	1/4	T	P	Rayf	Strm	...	D	W	Cott	12-1	165	36x5	40x10
Available	6700	3450	Cont	4 1/2 x 5 1/2	32.4	4	3	1/4	T	W	Strm	Eism	...	D	W	Prog	8-1	158	36x5	36x5D
Dart L	6500	3500	Cont	4 1/2 x 5 1/2	32.4	4	3	1/4	T	C	Mast	Mag	...	D	W	Filot	10-8-1	168	36x6	36x6D
Diamond T-LB	6600	3850	Buda	4 1/2 x 6	32.4	4	3	1/4	T	C	Mill	Bosh	...	D	W	Selec	4	160	36x5	36x5D
Duplex E	6050	4000	Cont	4 1/2 x 5 1/2	32.4	4	3	1/4	T	C	Sheb	Eism	...	D	W	Filot	8-1	130	36x5	36x5D
Federal W	7140	3150	Own	4 1/2 x 5 1/2	32	4	3	1/4	T	C	Mag	D	W	Selec	4	180	36x5	36x5D
GMC	Cont	4 1/2 x 5 1/2	32	4	3	1/4	T	C	Mar	D	W	Selec	4	12-1

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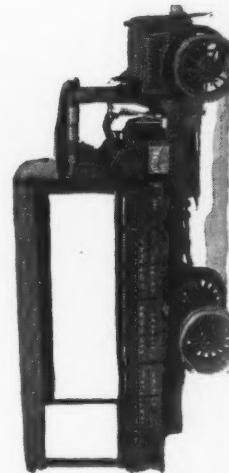
The Kissel Heavy Duty, 3 1/2-ton Flareboard Chassis, \$3150.
Also Stake, \$3300.
Kissel Motor Car Co., Hartford, Wis.



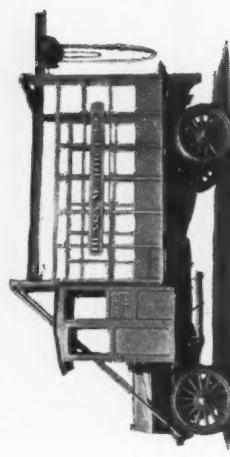
Master 3 1/2-ton Chassis.
Master Trucks, Inc., Chicago, Ill.



Universal Model L, 3 1/2-ton Chassis.
Universal Service Co., Detroit, Mich.



Standard Model 65, 3 1/2-ton Covered Flareboard, \$3530.
Also Steel Dump Bodies, \$3627, \$3490.
Standard Motor Truck Co., Detroit, Mich.



Harvey Model WHA, 3 1/2-ton Dump Body,
Chassis, \$3500.
Harvey Motor Truck Co., Harvey, Ill.



Menominee Model G, 3 1/2-ton Ice Body, Chassis, \$3580.
Menominee Motor Truck Co., Menominee, Mich.



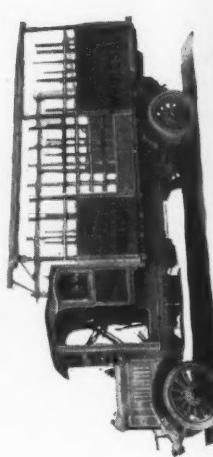
Hendrickson Model H, 3 1/2-ton High Stake,
Chassis, \$3000.
Hendrickson Motor Truck Co., Chicago, Ill.



Service Model 270, 3 1/2-ton Special Stake, \$3900.
Also Open Flareboard, \$3870; Dump, \$4300.
Service Motor Truck Co., Wabash, Ind.



Oneida Model D, 3 1/2-ton Stake, \$3600.
Oneida Motor Truck Co., Green Bay, Wis.



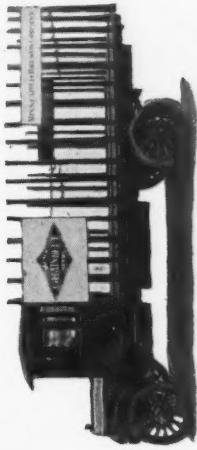
Sandoz Model E, 3 1/2-ton Stake, \$4250.
Also Open Flareboard, \$4200; Dump, \$4640.
Sandoz Motor Truck Co., Chicago, Ill.



Republic Model T, 3 1/2-ton Stake, \$4250.
Also Open Flareboard, \$4200; Dump, \$4640.
Republic Motor Truck Co., Alma, Mich.



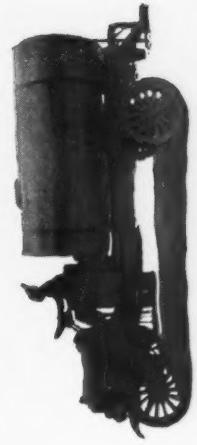
Velle Model 26-A, 3½-ton Special Stake, Chassis, \$3600.



Wilcox Trux Model P, 3½-ton Stake.
H. E. Wilcox Motor Co., Minneapolis, Minn.

3½ Ton Gasoline Commercial Cars

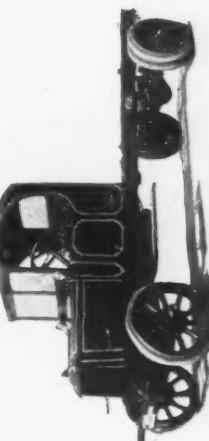
Name and Model Number	Chassis Weight g. c.	Engine Make	Horse Power	No. of Cylinders	Stroke in Mils per Cyl.	Valve Location	Head of Piston Rings	Name of Operator	Lubrication System	Drive	Transmission	No. of Gears	Rear Axle Make	High Gear Ratio	Wheelbase	Front Tires	Rear Tires	Governor Make	Per Cent of Weight on Front of Weight
Harvey WHA	7700	Buda	3850	4	32.4	T	Stern	T	Elsin	D	W	4	Sheld	8.8	160	36x5	36x5	Simp	80
Hendrickson H	4000	Wauk	3000	4	32.4	L	May	C	Dix	D	W	3	Tink	10.3	1	36x5	36x5	Own	75
Kissel	3150	Buda	412x6	4	28.9	L	Mast	C	Elsin	D	W	3	Shield	10.8	1	36x5	36x5	Pier	80
Master	4000	Buda	412x6	4	32.4	L	Cont	C	Elsin	D	W	3	Tork	10.3	1	36x5	40x5	...	...
Menominee G	6650	Cont	412x5	4	32.4	L	Cont	C	Elsin	D	W	3	Fiot	10.3	1	36x5	36x5	Own	80
Oneida D	6300	Cont	412x5	4	32.4	L	Cont	C	Elsin	D	W	3	Tink	10.3	1	36x5	36x5	Dup	80
Republic T	6332	Buda	2750	4	32.4	L	Cont	C	Elsin	D	W	3	Fiot	10.1	1	36x5	36x5	Rug	60
Sandow	6000	Cont	412x5	4	28.9	L	Cont	C	Elsin	D	W	3	Fiot	10.1	1	36x5	36x5	Mon	70
Service 270	6500	Buda	3300	4	32.4	L	Cont	C	Elsin	D	W	3	Tink	8.8	1	36x5	36x5	Simp	71
Service 275	7100	Buda	3600	4	32.4	L	Cont	C	Elsin	D	W	3	Tink	8.8	1	36x5	36x5	Own	74
Standard 65	6280	Cont	3350	4	32.4	L	Cont	C	Elsin	D	W	3	Tink	10.3	1	36x5	36x5	Pier	79
Universal L	6875	Buda	3600	4	32.4	L	Cont	C	Elsin	D	W	3	Head	10.3	1	36x5	36x5	Mon	85
Wiley 26A	...	Cont	3600	4	32.4	L	Cont	C	Elsin	D	W	3	Tink	11.8	1	36x5	36x5	Pier	73
Wichita O	6330	Wauk	3600	4	32.4	L	Cont	C	Elsin	D	W	3	Shield	11.8	1	36x5	36x5	Pier	75
Wilson X Trux P	6600	Own	3250	4	32.4	L	Cont	C	Elsin	D	W	3	Shield	11.8	1	36x5	36x5	C	80



Wilson, 3½-ton Tank Body, Chassis, \$3250.
J. C. Wilson Co., Detroit, Mich.



**Packard Model 3-E, 4-ton Special Express,
Chassis, \$4900.**



De Martini Model G-17, 4-ton Chassis with Cab, \$4250.



Moreland 17G, 4-ton Chassis, \$4150.
Moreland Motor Truck Co., Los Angeles, Cal.

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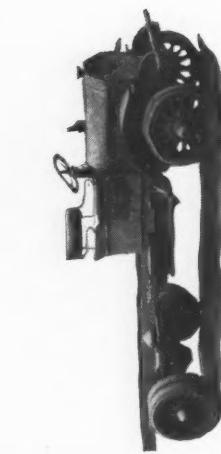
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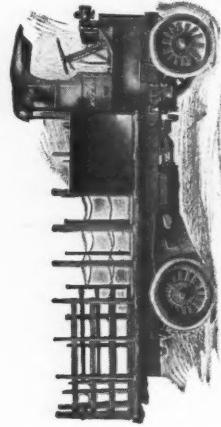
Signal Model M, 4-ton Chassis, \$3825.
Signal Motor Truck Co., Detroit, Mich.



Winther Model 87, 4-ton Chassis, \$4200.
Winther Motor Truck Co., Whithrop Harbor, Ill.



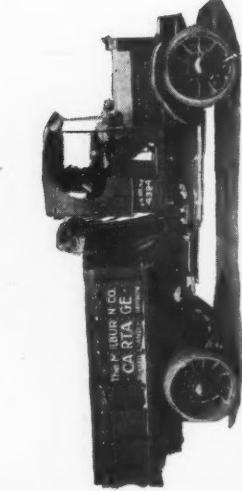
Harvey Model WKA, 5-ton Chassis, \$4600.
Harvey Motor Truck Co., Harvey, Ill.



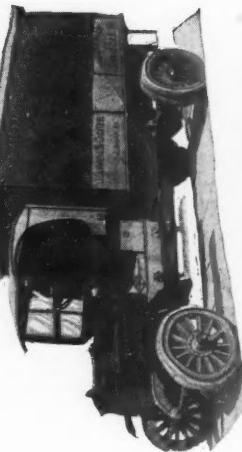
Avery Model B, 5-ton Stake
Also Open Flareboard; Panel.
Avery Co., Peoria, Ill.



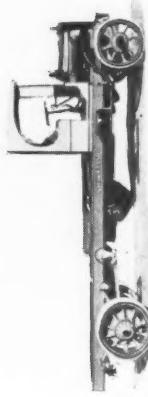
Federal X, 5-ton Dump Body, Chassis, \$4200.
Federal Motor Truck Co., Detroit, Mich.



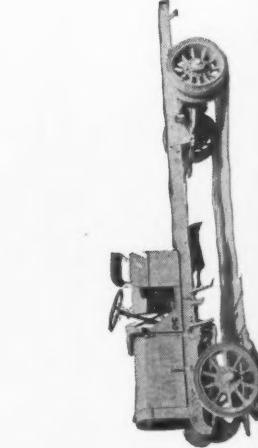
Moreland 17J, 5-ton Chassis, \$5000.
Moreland Motor Truck Co., Los Angeles, Cal.



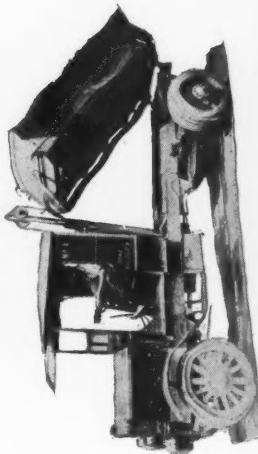
Menominee J, 5-ton Hoist Body, Chassis, \$4540.
Menominee Motor Truck Co., Menominee, Mich.



Diamond T, R, 5-ton Panel, Chassis, \$4750.
Diamond T Motor Car Co., Chicago, Ill.



Acason 5-ton Stake, Chassis, \$4200.
Acason Motor Truck Co., Detroit, Mich.



G. M. C. Model 101, 5-ton Chassis, \$4350.
General Motors Truck Co., Pontiac, Mich.



Menominee 5-ton Stake, Chassis, \$4200.
Menominee Motor Truck Co., Menominee, Mich.

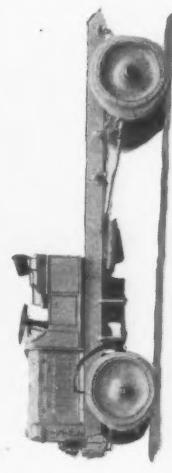
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Signal Model R, 5-ton Chassis, \$4750.
Signal Motor Truck Co., Detroit, Mich.



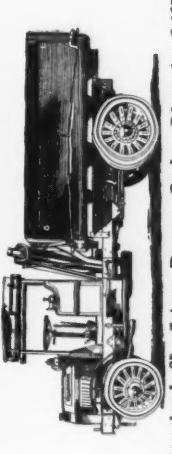
Wichita Model Q, 5-ton Chassis, \$4300.
Wichita Falls Motor Co., Wichita Falls, Tex.



Winther Model 107, 5-ton Chassis, \$5000.
Winther Motor Truck Co., Winthrop Harbor, Ill.



Service Model 300, 5-ton Dump Body, Chassis, \$4250.
Standard Motor Truck Co., Wabash, Ind.



Standard 85, 5-ton Dump Body, Chassis, \$4600.
Standard Motor Truck Co., Detroit, Mich.



Wilson 5-ton Flareboard.
J. C. Wilson Co., Detroit, Mich.



Republic Model V, 5-ton Chassis, \$4700.
Republic Motor Truck Co., Alma, Mich.



Titan 5-6-ton Platform, Chassis, \$5000.
Titan Truck Co., Milwaukee, Wis.



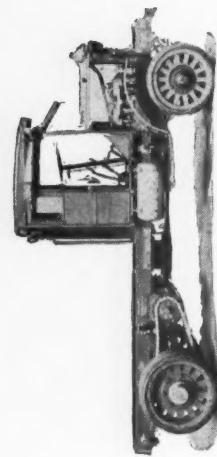
Wilcox Trux W, 5-ton Hydraulic Hoist Dump.
H. E. Wilcox Motor Co., Minneapolis, Minn.

4 Ton Gasoline Commercial Cars

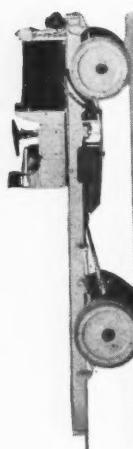
a. c.	Name and Model Number	Chassis Weight	Engine Make	Horse Power	Bores and Strokes	Stroke of Cylinder	Piston Ringes per Cylin.	Sleeve Piston Rings	Valve Location	Intake System	Starting System	Transmission	Gear Ratio	No. of Speeds	Governor Make	Front Tires	Rear Tires	Front or Rear Wheel on Rear Wheel
Aescar	8380	4200	Wauk	36.1	4 3/4 x 6 1/2	C	14	L	W	Eism	SP	D	W	Timk	11.7:1	Ont	38x6	40x7D
Available	7150	4500	Cont	32.4	4 1/2 x 5 1/2	H	14	L	W	Sheb	SP	D	C	Timk	9:1	Opt	38x7	36x7D
Diamond TR	8200	4750	Cont	44.1	4 1/2 x 5 1/2	H	14	L	W	Mill	SP	D	V	Timk	12.8	Opt	38x6	38x5D
Federal X	8360	4200	Own	32.4	4 1/2 x 5 1/2	H	14	L	W	Mar	SP	D	W	Timk	11.7:1	Opt	38x6	40x6D
GMC	8660	4400	Cont	41.2 x 5 1/2	32.4	4	14	L	W	Strom	SP	D	W	Timk	13.7:1	Opt	38x6	40x6D
Harvey WKA	8500	4540	Buda	41.2 x 6	32.4	4	14	L	W	Eism	SP	D	W	Timk	8.8:1	Opt	38x6	40x6D
Menominee J	8680	5000	Wauk	41.2 x 5 1/2	32.4	4	14	L	W	Eism	SP	D	W	Timk	13.7:1	Opt	38x6	40x6D
Moreland 17J	8600	4250	Buda	41.2 x 6	36.1	4	14	L	W	Pins	SP	D	W	Timk	13.7:1	Opt	38x6	40x6D
Republic V	8635	4200	Buda	41.2 x 6	32.4	4	14	L	W	Zen	SP	D	W	Timk	8.3:1	Opt	38x6	40x6D
Service 300	8380	4200	Wauk	41.2 x 6	32.4	4	14	L	W	Mast	SP	D	W	Timk	12.5:1	Opt	38x5	40x6D
Signal R	6800	4475	Cont	41.2 x 5 1/2	32.4	4	14	L	W	Eism	SP	D	W	Timk	13.7:1	Opt	38x6	40x6D
Standard 85	8500	5000	Buda	41.2 x 5 1/2	32.4	4	14	L	W	Sheb	SP	D	W	Timk	13.7:1	Opt	38x6	40x6D
Titan	9100	5000	Wauk	41.2 x 5 1/2	32.4	4	14	L	W	Per	SP	D	I	Timk	13.7:1	Opt	38x6	40x6D
Wichita Q	9100	5000	Wauk	41.2 x 6	36.1	4	14	L	W	Strom	SP	C	W	Timk	13.7:1	Opt	38x6	40x6D
Wilcox Trux W	7800	5000	Wauk	41.2 x 5 1/2	32.4	4	14	L	W	Bosh	SP	C	W	Timk	8.8:1	Opt	38x6	40x6D
Wilson	8500	5000	Wis	41.2 x 5 1/2	36.1	4	14	L	W	Eism	SP	D	I	Timk	13.7:1	Opt	38x6	40x6D
Winther 107	8500	5000	Wis	41.2 x 5 1/2	36.1	4	14	L	W	Mast	SP	D	I	Timk	12.5:1	Opt	38x5	40x6D

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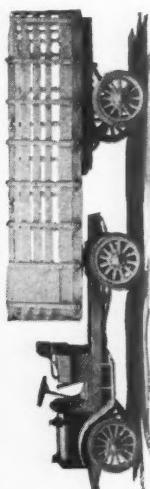
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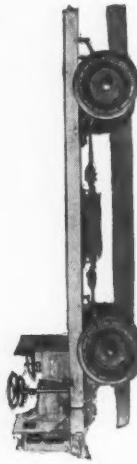
Western, 7-ton Chassis, Cab and Hoist, \$5000.
Western Truck Mfg. Co., Chicago, Ill.



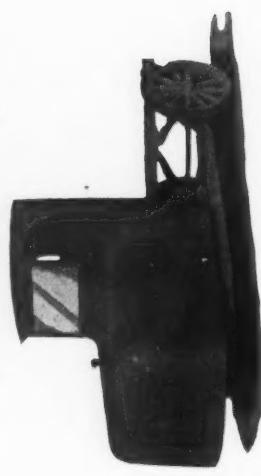
Winther Model 127, 6-ton Chassis, \$3000.
Winther Motor Truck Co., Winthrop Harbor, Ill.



Columbia Model T, 6-ton with Trailer, \$2700.
Columbia Motor Truck & Trailer Co., Pontiac,
Mich.



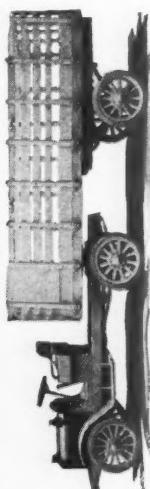
Kuhn, 5-ton Tractor, \$5000.
Kuhn Tractor Truck Co., Seattle, Wash.



Trucktor A, 5-ton Tractor, \$1750.
Highway Tractor Co., Indianapolis, Ind.



Packard Model 5-E, 6-ton Dump, Chassis, \$4900.
Packard Motor Car Co., Detroit, Mich.



Master 6-ton Tractor, \$2250.
Master Trucks, Inc., Chicago, Ill.



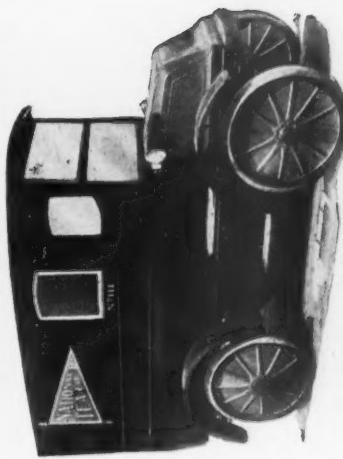
6 Ton Gasoline Commercial Cars

G. C.	Name and Model Number	Chassis Weight	Engine Make	Horse Power	Bore and Stroke	Stroke of Piston in Miles per Cylin.	No. of Cylinder	Name of Cylinder	Carburetor	Starting System	Transmission	No. of Speeds	Drive	Rear Axle Make	High Gear Ratio	Front Tires	Rear Tires	Governor Make	Pr. Count of Wheels on Rear	Pr. Count of Wheels		
Packard 5E Winther 127	8650 9000	4900 5000	Own Wis	55x5 1/2 5 1/2x6	40 42	4 3 1/4	3 3 1/4	L T	C Br	Fed Own Strom	Dix Elsm Bosh	Bij	Fo Fo	D D C	W Prog Selc	4 4 4	Flot Dead Opt	10.7-1 162	156 162	36x6 36x6	40x6D 40x7D	77 70
Packard 6E Western	8925 9500	5150 5000	Own Wis	5x5 1/2 4 3/4x3 1/2	40 36.1	4 4	3 3 1/4	L T	C T	Fed Own Strom	Dix Elsm Bosh	Bij	Fo Fo	D D C	W Prog Selc	4 4 4	Flot Dead Opt	10.7-1 162	156 162	36x6 36x6	40x7D 40x7D	78 90
Columbia 6-ton Kuhn 5-ton Master 6-ton Tractor 5-ton	3700 3900 3100	1900 5000 1750	Cont Wis Buda Cont	4 1/2x5 1/2 4 1/2x5 4 1/2x5 1/2 3 1/2x5	27.2 28.9 28.9 22.5	4 3 3 4	3 3 3 2.5	L T C L	C H H G	Lng Rayf Mast Sheb	Eism Bosh Elsm Dix	Shk	Fo Sp Fo FS	C C D D	I B I I	3 3 2	Cott Selc Selc Selc	3 3 2	Pier 65			

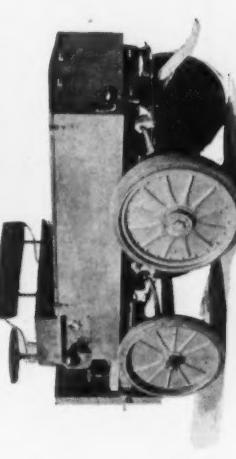
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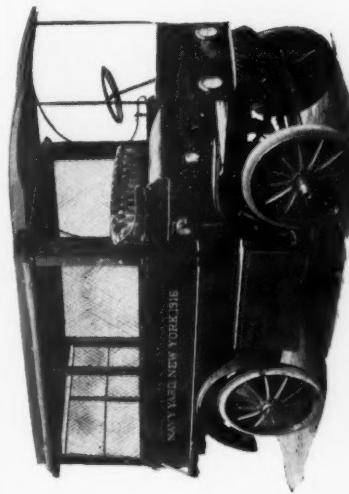
Walker Model D, 3-ton Open Express.
Walker Vehicle Co., Chicago, Ill.



Walker Model M, 1000-lb Panel.
Walker Vehicle Co., Chicago, Ill.



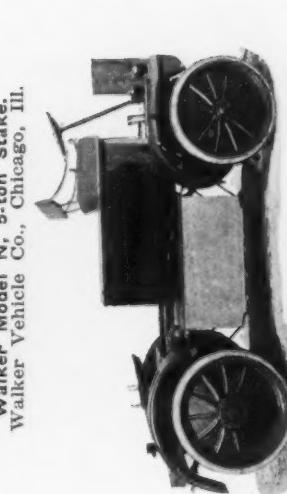
Walker Model 3, 15-ton Tractor.
Walker Vehicle Co., Chicago, Ill.



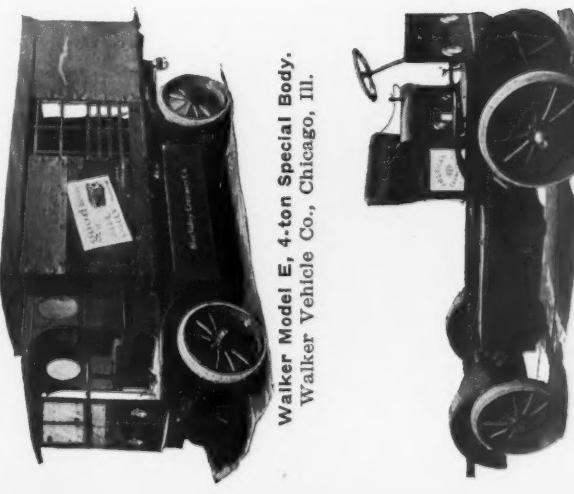
Walker Model E, 4-ton Special Body.
Walker Vehicle Co., Chicago, Ill.



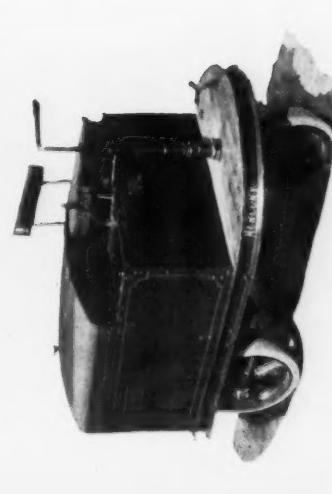
Walker Model K, 1-ton Screen Side Express.
Walker Vehicle Co., Chicago, Ill.



Walker Model N, 5-ton Stake.
Walker Vehicle Co., Chicago, Ill.



Walker Model L, 2-ton Chassis.
Walker Vehicle Co., Chicago, Ill.



Mercury Model Z, Tractor, \$1190.
Mercury Mfg. Co., Chicago, Ill.

Name and Model Number	Capacity	Chassis Weight	Chassis Price	Maximum Speed	Motor	Drive	Speeds Forward	Front Axle	Rear Axle	Wheelbase	Per Cent Weight on Rear Wheels
Walker M	1000	2300	...	15	Opt	60	West	West	5	...	34x3
Walker K	2000	2500	...	14	Opt	55	West	West	5	...	34x 1/2
Walker L	4000	3700	...	13	Opt	55	West	West	5	...	38x4
Walker D	6000	4700	...	12	Opt	50	West	West	5	...	36x5
Walker E	8000	5700	...	11	Opt	50	West	West	5	...	38x5D
Walker N	10000	6300	1190	10	Opt	50	West	West	5	...	38x6D
Mercury	...	1310	6.5	Opt	25	W...	West	West	5	...	21x3 1/2
Walker	10	5000	...	Opt	25	West	West	West	5	...	38x5D
Walker	15	4500	...	Opt	25	West	West	West	5	...	38x6
							Own	Own	5	Opt	36x3 1/2
							Own	Own	5	Opt	36x4
							Own	Own	5	Opt	38x5
							Own	Own	5	130	38x5D
							Own	Own	5	Opt	38x6
							Own	Own	5	Opt	38x6D
							Own	Own	5	40	15x3 1/2
							Own	Own	5	90	34x4
							Own	Own	5	70	38x6

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895	4 16.9	Republic Motor Truck Co. 21
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1750	4 22.5	Acme Motor Truck Co. 23
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1750	4 22.5	Hawkeye Mfg. Co. 26
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2190	4 22.5	Menominee Motor Truck Co. 26
2200	4 22.5	Federal Motor Truck Co. 25
2200	4 25.6	Service Motor Truck Co. 26
2300	4 27.2	Starr Carriage Co. 26
2350	4 22.5	General Motors Truck Co. 25
2375	4 27.2	Signal Motor Truck Co. 26
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2275	4 28.9	Dorris Motor Car Co. 28
2295	4 22.5	Palmer-Meyer Motor Car Co. 30
2300	4 27.2	Noble Motor Truck Co. 29
2400	4 28.9	Acason Motor Truck Co. 27
2450	4 27.2	Acme Motor Truck Co. 27
2450	4 27.2	Available Truck Co. 27
2450	4 24	Federal Motor Truck Co. 28
2500	4 36.1	Avery Co. 27
2500	4 28.9	Service Motor Truck Co. 30
2500	4 27.2	Standard Motor Truck Co. 30
2500	4 19.6	Wichita Falls Motor Co. 30
2615	4 27.2	Menominee Motor Truck Co. 29
2650	4 28.9	Dart Motor Truck Co. 28
2690	4 27.2	General Motors Truck Co. 28
2750	4 22.5	De Martini Motor Truck Co. 28
2750	4 28.9	Fageol Motors Co. 28
2775	4 27.2	Diamond T Motor Car Co. 28
2800	4 25.6	Packard Motor Car Co. 30
2800	4 25.6	Winther Motor Truck Co. 30
3000	4 27.2	Oneida Motor Truck Co. 30
3250	4 28.9	Nash Motors Co. 29

4 Ton Commercial Cars

Price Cyl. H.P.	Maker	Page
3825	4 32.4	Signal Motor Truck Co. 36
3900	4 32.4	Packard Motor Car Co. 35
4150	4 36.1	Moreland Motor Truck Co. 35
4200	4 28.9	Winther Motor Truck Co. 36
4250	4 28.9	De Martini Motor Truck Co. 35

5 Ton Commercial Cars

Price Cyl. H.P.	Maker	Page
4200	4 36.1	Acason Motor Truck Co. 37
4200	4 32	Federal Motor Truck Co. 37
4250	4 32.4	Republic Motor Truck Co. 37
4250	4 32.4	Standard Motor Truck Co. 37
4300	4 32.4	Service Motor Truck Co. 37
4300	4 32.4	Wichita Falls Motor Co. 37
4350	4 32.4	General Motors Truck Co. 37
4475	4 32.4	Signal Motor Truck Co. 37
4500	4 32.4	Available Truck Co. 37
4500	4 44.1	Avery Co. 37
4540	4 32.4	Menominee Motor Truck Co. 36
4600	4 32.4	Harvey Motor Truck Co. 36
4750	4 32.4	Diamond T Motor Car Co. 37
5000	4 36.1	Moreland Motor Truck Co. 36
5000	4 32.4	Titan Truck Co. 37
5000	4 36.1	Winther Motor Truck Co. 37

6 Ton Commercial Cars

Price Cyl. H.P.	Maker	Page
4900	4 40	Packard Motor Car Co. 38
5000	4 42	Winther Motor Truck Co. 38

Gasoline Truck Tractors

Price Cyl. H.P.	Maker	Page
1750	4 22.5	Highway Tractor Co. 38
1990	4 27.2	Columbia Motor Truck & Trailer Co. 38
2250	4 28.9	Master Trucks, Inc. 38
5000	4 28.9	Kuhn Tractor Truck Co. 38

Electric Truck Tractors

Price Cyl. H.P.	Maker	Page
1190	Electric Mercury Mfg. Co.	39

War Creates Demand for Motor Cars in Scandinavia

The people of Scandinavia, made suddenly rich by war business, are becoming interested in automobiles. Public garages are being built, the farmer's prejudice against automobiles is rapidly disappearing and plans for good roads are on the way. Gasoline in Sweden at present ranges in price from \$1 to \$3 per gallon and government conservation measures forbid the buying of gasoline without permission from the industrial committee. Sweden and Norway have very few tires, and in Denmark only 50 per cent of the tires are being used because of the scarcity of gasoline. Swedish buyers, in many cases, are paying as much as \$300 for one tire. The Royal Automobile Club of Norway is licensing all buyers of tires and co-operating with Great Britain to see that none of these get out of the country. The scarcity of horses in Denmark has opened a big market for trucks and tractors. Denmark, with a population of 3,000,000 is a farming country and will require large numbers of tractors. Sweden is mostly industrial and forms a good market for trucks. Norway concentrates largely on fishing and shipping. Norway, with its huge tonnage, together with Sweden, will handle goods in transit to Russia after the war. The style of body most desired in Scandinavia has a disappearing top and pointed radiator and dark colors are preferred.

Believes in Future of Truck and Passenger Car, Too

The Lutz Automobile Co. of Buffalo, handling the MacFarland passenger car, has recently taken over the agency of the Selden truck, and W. A. Lutz, head of the company, explained the move by saying he expected to increase business materially without any additional overhead. "We have the room and the equipment and we can make repairs and give the other service," he declared, "and the truck business will be all to the good."

"We have not taken the truck agency against a possible time when passenger car business will slump," he continued. "I believe the future of both motor truck and passenger car is brighter than ever. Our passenger car sales this fall and winter have been greater than in the fall and winter of any other years. More people are buying high-priced cars than ever before. People are living better than they ever lived before. Families which we used to think maybe owned their little house and had perhaps a thousand in the bank are digging up \$5,000 for a good car. You can't expect people to get along without the comforts of the age when business is booming and they've got money in the bank. Why, every business is good and we've got all the money in the world."

"The truck and the passenger car are superseding horses everywhere. Even if it were not for the superiority of the motor car over the horse, there are not enough horses anyway. Not only corporations but municipalities are replacing horses with motor-driven vehicles. Take

Buffalo. We're using motor trucks in the fire department, police department, water bureau, bureau of streets, and other branches of government. Only a few years ago all our fire apparatus was drawn by horses; now practically all is motor driven. The patrol wagons used horses until a year or two ago; now the vags ride to the police stations and the prisons in motor cars. And every chief and assistant has his own passenger car at the city's expense."

"Buffalo has just opened bids for more motor-driven fire apparatus; Rochester placed an order yesterday for six motor trucks, all Seldens, by the way, and Worcester, Mass., has recently bought four Seldens.

"Yes, the truck is a profitable addition to the business of any passenger car dealer who is equipped to handle truck business, or who can easily make the necessary changes, but the future of both the truck and the passenger car is as bright as bright can be."

Des Moines Dealers Elect Officers.—Des Moines Automobile Dealers' Association, at its annual meeting, elected the following officers: Dean Schooler, president; W. W. Sears, vice-president; C. G. Van Vliet, secretary. C. W. Payne, C. G. Van Vliet and C. L. Herring were chosen to fill vacancies on the board of directors. An aggressive advertising campaign for the Des Moines show, to be held late in February, is being planned by the dealers.

Market for Tractors and Farm Implements in England

Merchants in the Birmingham district report a steadily increasing demand for tractors and farm implements of all descriptions. Farmers are becoming more interested in mechanical appliances than ever before, owing to the increased claims upon the land in connection with the supplementing of home-grown food supplies and the difficulty of securing sufficient labor.

Oil-driven engines of moderate power are being called for by agriculturists. Engines of about $2\frac{1}{4}$ h.p. are being installed for the operation of mechanical milkers and other purposes, while for pulping, chaff-cutting, etc., engines of somewhat larger capacity are sold. A considerable number of the tractors now being acquired by individual farmers are of the type introduced from the United States by the Board of Agriculture.

Winther Motor Truck Co., Winthrop Harbor, Ill., announces two new truck models. The company's line of trucks is now complete, from one to seven tons inclusive. The Winther company started production only a year ago. The production of a complete line of trucks has been possible owing to the fact that the fundamental design of all models is the same, the models varying only in size and capacity.



(Drawn by W. K. Ireland. Contributed by the Diamond Rubber Company, Akron, Ohio)

The Cartoonist Has Caught the Right Idea. It is to be Hoped That It May be so Contagious That It Will Quickly Spread Over the Whole Country

[See the Articles on "Highway Freight," in the January issue, pages 7 to 12, and 22 to 24A, inclusive; and in this issue, pages 76 to 82.—Editor.]

Commercial Car Manufacturers' Convention

Remainder of Report of Meeting of the National Automobile Chamber of Commerce on Co-operation With the Government

ON the first two reading pages of the January number was a report of part of the meeting of commercial car manufacturers held at the headquarters of the National Automobile Chamber of Commerce, January 8. As related therein the purposes of the meeting were:

First:—Service to the Government, co-operating with its motor truck program;

Second:—Service to the Government in assisting to relieve the railroad congestion by the use of motor trucks;

Third:—Service to the motor truck industry so that manufacturers may better understand the demands to be made upon them and be better prepared to meet them.

Windsor T. White, chairman of the N. A. C. C. Commercial Vehicle Committee, presided, and the report as far as it went, covered the opening address by Charles Clifton, president of the National Automobile Chamber of Commerce and two of the papers and discussions, "Maintaining a Record of Unselfish Cooperation," by Geo. M. Graham, assistant commercial manager of the Pierce-Arrow Motor Car Co., and "Delivering Army Trucks by Highway," by Major Edward Orton, Jr., Quartermaster's Department, U. S. A.

Automobile Industries Patriotic

Next on the program was an address by Hugh Chalmers, of the Automobile Industries Committee, in which he described the organization of that committee. This committee has offices in Washington and a corps of ten engineers. A new program of work is to come out which is before Congress now and will mean a tremendous amount of work. The speaker pointed out that the feeling that passenger car business is "pleasure" car business has passed by. He declared that he does not feel that there will be any official curtailment of the automobile industry; the only curtailment will be the natural one coming from the restrictions of materials and transportation. Automobile manufacturers have been loyal and patriotic and have contributed of their best men and best brains to the war, far more than any other industry. On this point he said, "We would like to have business as usual if we could, but we can not have business as usual, and we as red-blooded business men are more interested in having democracy after the war than we are in having business as usual during the war."

Telling more of the committee's work, he explained that the committee has a survey of every automobile and accessory plant in the country and recommends where work can be done best.

The next speaker was H. L. Horning, of the Automotive Section of the War Industries Board. Commenting on the importance of the motor truck, he said:

"Since I have had the pleasure and honor of serving the industry at Washington I have found that the motor truck has at last come to the point where it is a national necessity." Among developments of the near future that will interest the industry he referred to parcel post service by motor trucks. Cooperation not competition is wanted to make this effective. The potential market for the motor truck is hardly touched.

Speaking of the place motor trucks should have in the transportation of the country, he said, "I do not know of any greater opportunity any industry could have than that which faces you today. The motor truck should enter into the transportation system in the United States in such a way that it never again could be put out of its place."

Mr. Horning made the surprising statement that the future holds no problems in regard to gasoline. Said he, "It is probably a fact that never will we be faced again with the problem of a shortage of gasoline." There is at present over production of 1,000,000 gal. a day.

The speaker urged truck makers where possible to stop using materials that the Government must have and use substitutes in their places. Concluding, he said, "The automobile industry is the one industry that is making possible the delivery to the front of those things that stand for force in the wiping out of the thing that we are fighting against, and there is no other body in the world that can so back up the program of our country, can so help to solve the problems."

Need of Uniform Legislation

The chairman of the meeting, Windsor T. White, was the author of the first paper of the afternoon session, "Legislation Affecting the Use of Motor Trucks." It was a plea for reasonable laws that will not impede the development of the use of commercial cars and a uniformity in the regulations of the different states so that a car that complies with one state's requirements will not be prevented from operating in another state. "The general public," he declared, "does not realize how vital the motor truck industry is to our prosperity, and legislators do not appreciate the utility of motor trucks." Quoting from English experience he stated that the British Road Board reports that it is less costly to highway authorities in the long run to construct roads of a type suitable for the traffic rather than to continue the use of materials and methods that have become antiquated. It is wrong to seek to preserve the roads by ruling against motor trucks instead of studying out ways of building roads that will stand the traffic.

He proceeded to cite numerous examples of unreasonableness in existing laws. One

of the worst faults is indefiniteness which leaves the truck owner uncertain as to what he may or may not do. Even townships in the same state have such different laws that are so frequently changed that the commercial car user is constantly perplexed to keep within the law. Speeds, allowable loads and tire widths all vary from state to state most confusingly.

The speaker emphasized the present timeliness of concerted action on the part of the industry to get uniform and reasonable legislation in view of the extended use of the highways being made by the Federal Government and the fact that the public is becoming educated to the utility of motor trucks in relieving freight congestion. Most important is it that the states shall determine what regulations shall affect commercial cars and not leave it to political sub-divisions of the states. Mr. White then outlined a scheme for national road organization supported by motor truck manufacturers to obtain proper regulation in the various states.

Increasing Interest in Roads

S. M. Williams, of the Garford Co., discussed some of the work being done in the matter of highway improvement so that highway transportation may be made more effective. He referred to the highway officials meeting at Richmond a few weeks ago where, instead of condemning the motor truck as formerly, they recognized it as having come to stay and asked for a campaign of education and publicity to teach the people its importance and the kind of roads it must have.

He also referred to a recent meeting in Pittsburgh of representatives of the National Association of Industries to organize on good roads work. The following were given as its objects:

"To assist in co-ordinating the highways with other transportation agencies throughout the country, to encourage and to stimulate their use in such a manner as to facilitate the transportation of food, raw materials and finished products, and to co-operate with Government agencies, both state and national, to the end that our highways may be of service in relieving the present transportation situation of the country."

The idea is to send men into the different congested districts to analyze and study conditions and report to the Highway Transport Committee, and to give the information also to the newspapers to educate the people to the necessity of using highway transportation.

At this point, J. F. Winchester, secretary of the Motor Truck Club of New Jersey, told of some of the bad features of the laws of that state as they affect motor trucks.

The next paper was on the "Work of the Highway Transport Committee," by

Roy D. Chapin, chairman of that committee. Mr. Chapin opened his remarks with the thought that to the three m's, "men, money and materials," must be added transportation as an essential in the waging of war. Endorsing the taking over of the railroads by the Government, he drew attention to the fact that while the Railways War Board was still in control, it requested the railroads to put upon the highways and inland waterways as much short haul traffic as was feasible. As he said, it was a recognition of the fact that the motor truck had come to play a part in transportation for short distances that made it a proper means, an economical means for carrying freight. To the express companies was issued a similar order to make use of motor trucks over the highways instead of the railroads.

The highways, Mr. Chapin said, must be used more and more each succeeding month. After the war is over he thinks the motor truck will find its permanent place.

Encouraging Road Maintenance

It is a part of the Highways Transport Committee's duties to study possibilities of a much greater effort in the operation of motor trucks, which includes co-operating with the various highway authorities in connection with the maintenance of the roadbeds.

The question of terminal congestion is greatly relieved by reducing the freight handled through them that can as well go by motor truck. Embargoes can bring this about. The first consideration is are there enough motor trucks and the second are the road conditions and snow removal conditions such that trucks can be used every day in the year or at least six days in the week.

Various agencies are outlining a plan to relieve the congestion at the big eastern shipping points that will throw a considerably greater amount of transportation over the highways.

One of the next things will be to see, as they do in England, that loads are carried both ways by trucks. When this is done the motor truck easily proves itself the most economical means of carrying freight.

Concluding, Mr. Chapin remarked the tremendous expansion ahead of the commercial car as a means of transportation and suggested that the industry appoint a committee to confer with Washington officials and committees for the benefit of the industry and the good of the country in these critical times.

"Motor Trucks in Short Haul Work" was the subject of the next paper and was presented by George H. Pride of the Heavy Haulage Co. From his experience he holds that the commercial car is justified, first for emergency work, second for delivering and third for handling high-grade freight and always where there would be a trucking haul to and from the railroad station. Even when trucking may cost more, this may be compensated by reduced breakage or greater surety of service. The real test is on full carload lots. Then is when competition with the railroads is most severe. If the commercial car service can get a start by attractive rates the patron will never go back to railroads after having

a taste of the greater reliability, even if the rate is raised. Service is of more account than a slight difference in rates.

In combination with the waterways the speaker believes there is a great field for motor hauling.

George C. Diehl, chairman of the Good Roads Committee of the American Automobile Association, presented the next paper on "Highways for Heavy Hauling." He maintained that every general principle that applies to a railroad system will apply, with slight modifications, to a highway system.

The speaker gave some practical points on highway layout and construction, taking up such considerations as length, width, grades, bridges, snow removal, etc. He also spoke in favor of parallel roads across states to relieve density of traffic and, when any section of one road is under repair, to provide detours over the other road.

The last scheduled feature of the program was an address by Christian Groll, director of production, Military Truck Division, Quartermaster's Department, U. S. A. He complimented the manufacturers for putting at the head of their program "Service to the Government, co-operating with its motor truck program." Said he, "Those of you who have not been fully in accord with the entire program from the beginning have shown your great patriotism in a typically American way by assisting the Government in whatever it finally decided to undertake."

Military Truck Production

Speaking of the expected production of the standard military trucks he announced that of the Class B or heavy duty trucks, probably 50 to 100 trucks would be completed during January. Three samples of the Class A have been completed and some of the Class AA will be completed shortly.

He announced also the prospect that soon the commercial car business of the Government will be under one head. It is also anticipated that shortly a committee will be formed of the truck makers, the assemblers and the parts makers that will deal for the Government with the industry and with some one man whom the Government may choose from among the manufacturers to conduct the work who knows the makers and knows their strength and their weakness. If that can be done the speaker hopes that the N. A. C. C. will get behind that program and take the burden off from the Government's hands.

As a result of its deliberations of the day the convention adopted the following set of resolutions:

- Resolved, That the motor truck manufacturers of the United States, in convention assembled in New York on January 8, 1918, hereby tender to the President of the United States, to the Secretary of War and to the Council of National Defense, their services and co-operation in meeting the transportation needs of the Government and the country, and offer the facilities of their factories to aid in the prosecution of hostilities against the Governments of countries with which the United States

is at war. It is resolved, That copies of this resolution be addressed to the President and the Secretary of War.

- Whereas the present unprecedented crisis in the railroad transportation service of the country has made imperative an extraordinary development of motor trucking by highway to meet the needs of the War Department of the Government and of the industry and commerce of the United States, and

Whereas it is essential to the effective use of motor vehicles as a measure of relief of freight and express congestion that the main highways be put and kept in good usable condition for the movement of the products of farm and factory, it is

- Resolved, That the Director-General of the Railroads be urged to raise the embargo against the use of open-top railroad cars for the shipment of road materials and machinery in sufficient time to permit of resumption of highway construction and repair early next spring in the northern states and, if conditions permit, that this portion of the order be rescinded this winter in so far as it affects the Southern States and California.

- Resolved, That a committee of five representatives of motor truck manufacturing companies be appointed by the president of the National Automobile Chamber of Commerce to co-operate with and assist the Highway Transport Committee of the Council of National Defense in working out problems arising in connection with the organization and development of transportation by public highway for the relief of railroad freight congestion and to facilitate the movement of military trucks and the transportation of the mails.

- Resolved, That the representatives of motor truck companies in attendance at this convention indorse unanimously the work and plans of the Highway Transport Committee of the Council of National Defense and hereby tender the full co-operation of the motor truck industry in developing ways and means for increasing the effectiveness of the motor truck in moving merchandise and other freight and express matter.

- Resolved, That the motor truck manufacturers of the United States, assembled in convention January 8, 1918, who view with increasing apprehension the various forms of drastic motor truck legislation already passed and other forms threatened, hereby appeal to the Council of National Defense, asking the council to request the various states in this time of stress when transportation is the need of the hour, to refrain from passing or enforcing any unreasonable legislation that would interfere with motor truck transportation.

Pan-American Motors Corp., Decatur, Ill., has recently concluded negotiations whereby it has acquired the Lumb Motor Truck & Tractor Co., of Aurora, Ill. Preparations for a substantial production are under way, and the Lumb two and three-ton trucks will be manufactured in future under the name Pan-American. The third large manufacturing building has been completed, which gives the company a floor space of 80,000 sq. ft.

How Hauling Will be Done in the Future

A Forecast of Probable Developments in the Use of Commercial Cars for Conveying Passengers and Handling Merchandise

By D. LLOYD SMITH*

MUCH thought has been given to and a great deal written and said relative to the future development of the motor truck industry with a view to determining the trend of motor truck design and what the future of the industry may be. In almost every case thought has been directed more by the commercial aspects of a relatively new business than by any careful study of the transportation problem that confronts the public. Every manufacturer has attempted to diagnose the market condition which confronts him as a maker of this or that size of vehicle, but practically no thought has been given to what influences may come up in the future development of country-side or city which may have some direct bearing upon the future possibilities of the industry as a whole.

It might be well to consider at length just what kind of haulage problems will arise at some later date and ask ourselves what and how the movement of merchandise, not to mention passengers, will be accomplished five or twenty years hence. Consideration of such a question as this, of course, at such a time as the present when the whole activities of the world are in a more or less chaotic condition due to the great war that has embroiled all nations, is influenced by war time conditions. But when this great war is over it is very safe to assume that a great many of the precedents and methods established in the midst of war conditions will survive and be adapted to the normal life of peace times. Where will it all end?

Efficiency is Being Emphasized

War is the maker of efficiency and a trend toward efficiency brought into being by the necessities of war times would seem to indicate that efficiency will be the keynote of all business operations thereafter. All manufacturing and mercantile business, as well as all development work, involves a great amount of transportation. Raw materials are required for manufacturers and these must be moved from the point of origin to the manufacturing centers from whence are distributed a vast volume of manufactured items, some to the ultimate consumer and some to be devoted to the production of more raw materials. How will we handle this a few years hence?

The things to be moved are both freight and persons and can be considered from three points of view. First, in the cities and large towns; secondly, between cities and, lastly, in the agricultural districts or the open expanses yet undeveloped.

The movement of passengers in cities has for a great number of years been handled through the medium of street railways operating either on the surface or on ele-

vated or subway structures, but there has been some development along the line of moving passengers by motor vehicle, although this development in the United States has not yet become as extensive as that in European cities. The most notable example of the hauling of passengers by motor vehicle that presents itself within the United States is the motor bus operation of the Fifth Avenue Coach Co. in New York City. This company more nearly approaches the European standards of passenger transportation than any other installation in the country, and that it has a function in New York is evidenced by the fact that for the past two years this company has carried approximately 20,000,000 passengers per year a distance of over 5,000,000 miles. Recently similar operating companies have appeared in other of our large centers, notably in Chicago, where a new company has been operating very satisfactorily for about six months. Such European cities as Glasgow, London, Vienna, Paris and others have used the motor bus for a number of years and our American cities are beginning to follow their leadership.

Rise and Fall of the Jitney

Some two years ago a new type of passenger transportation made its appearance on the streets of our American cities. The jitney, originating in Los Angeles, rapidly spread to every city of any consequence in the United States and for a while wrought dire havoc to the receipts of our street railway companies. The jitney came in response to what seems to have been a well-defined demand for a means of transportation more flexible than it is possible to obtain with the electric surface railways now in vogue in our American cities. The one circumstance which seemed to have ended the existence of the jitneys was the fact that they were operated by a great number of individual operators whose total financial responsibility individually brought them into ill repute because no means could be found to regulate them so as to prevent danger to human life. Consequently the jitney was legislated out of business.

The advent of the jitney, however, and the demonstrated utility of the motor bus when properly administered would indicate that the automobile has a place within our cities as a means of transporting passengers. The congestion in our larger cities is becoming a serious thought to Chambers of Commerce and some means will have to be devised to relieve the congestion. Investigation has shown that much of the congestion is directly traceable to street cars which, on account of their operation on fixed tracks, are unable to take advantage of the ebb and flow of pedestrian and vehicular traffic.

It is conceivable that the ultimate outcome and solution of this passenger hauling

problem in our cities will be the relegation of the street car tracks and street cars to a place under ground and the use of the motor bus of the small-unit type which will represent the "in between" method of transportation having the comforts of the railway car and the speed and mobility of the jitney. This will not be the irresponsible individually owned motor vehicle but the substantial corporation owned and operated vehicle which will eliminate the great objection to the jitney, namely, the lack of anyone on whom to place the responsibility for recourse from accident. This service will be augmented by the highly specialized and professional taxi companies who have even now demonstrated their ability to handle the public cheaper and better than it has been thought possible. What part the airplane will have in this scheme of passenger transportation cannot be predicted, but unquestionably aero-passenger service will be found in vogue after the war.

The removal of the surface street car from the streets of our cities will in all probability be followed by the more or less complete removal of the horse, and the relief from congestion that will be evidenced by the disappearance of the horse and street car will augment considerably the use of the motor truck in the handling of freight. The horse himself is disappearing from our midst rapidly. It has been stated by military authorities that approximately 10,000,000 horses and mules have been killed thus far in the war. Our own government needs immediately approximately 700,000 horses and mules and it requires but little effort of the imagination to see a shortage of draft animals not only on the farm but in the cities. More manufacturers and business houses will motorize beyond question and there will be a tremendous market for motor trucks from this source.

Care of Truck in Use a Factor

Under present methods of manufacture these manufacturers and business men will find but little difference in the standard makes of motor trucks to choose from. One truck will do their work practically as well as another and the success and efficiency of one manufacturer's product over another will come to be recognized more as a matter of administration of the truck installation than due to any inherent superiority of the truck itself.

Innumerable instances can be pointed out where large businesses have invested in motor truck equipment hundreds of thousands of dollars and even millions, and this huge investment is entrusted to men of a calibre far from commensurate with the amount of money at stake. These men are often carried over from the days of

* Sales Engineer, Motor Truck Research Department, Selden Truck Sales Co.

horse-drawn equipment and have not yet ceased thinking in terms of horse. How often have we heard the business head decry the motor truck when in almost every instance his difficulties are directly traceable to inefficiency in his own organization on the part of the men actually in charge of haulage.

To most businesses, in fact to almost every business, the movement of freight into the establishment and the movement out are only irritating appendages to the regular work in hand. To the mercantile house merchandising is the paramount issue. To the manufacturers the actual operations of converting crude material into the manufactured product are the only really important ones. All else is merely accessory and there is not a mercantile house or manufacturer who would not be glad to be relieved from the actual administration of a delivery department. In a great many instances his equipment, whether horses or motor trucks, is only small in amount and the overhead charges become excessive for so small a business.

As a result of these conditions there are beginning to come into being motor transfer companies whose function it is to combine several delivery problems into one. Up to the present, however, these transfer companies have been in the hands of men who might be termed amateurs and who are able to exist because their method is just a little better than that of the concerns whom they serve. At some not far distant day, however, there will appear in our large cities a great hauling corporation with a capital as great as any of our largest industries, dominated by men who are transportation experts and engineers who have studied every angle of the great city's hauling problem.

Future Big Hauling Companies

This great hauling concern will be able to so thoroughly systematize and handle the movement of freight within our cities that practically without exception every mercantile house and manufacturing concern will entrust their delivery both to and from their establishments to them. Even in the outlying districts the deliveries of the grocer and butcher can be so combined as to preclude the necessity of the small merchant maintaining as much as one motor or horse. Some thought will have to be given to the disposal of the equipment already on hand by the concerns served and in all probability the transition to this type of hauling will have to be more or less gradual, but beyond doubt the highly expert professional hauling corporation will become an actuality. It will truly be a public service corporation and as necessary to business as the telephone or telegraph.

With the freight handling in our cities thus taken care of it is natural to suppose that these large companies will extend their radius of activity until they are overlapping, which will bring about the necessity of considering the movement of freight between cities. Much has been accomplished already in this connection. Motor trucks are today moving freight as far as a thousand miles and it is somewhat startling to realize the fact that today the motor truck is competing successfully with the railroad. It is barely possible that the de-

velopment of this feature of our future hauling problem will precede the development within the cities, inasmuch as we are, as a nation, confronted today with a great problem of moving material from one end of our country to the other on account of the great congestion of railroad facilities.

When one considers that a total of almost 80,000 cars are required for the movement of a million soldiers themselves without consideration of the vast tonnage of war materials which must follow after our soldiers, it is very easy to comprehend the necessity of some steps being taken to augment the present rail facilities. The government at Washington is even now investigating road and traffic conditions with the view of devising some plan of moving military supplies here and there throughout the country by motor truck so as to relieve as much as possible the rail situation which is handicapping our industries, as well as to avoid the delays incident to rail congestion.

It is not beyond the realm of imagination to believe that there may develop a great transcontinental motor truck railroad as it were. Wide concrete ditches for roadways, wide enough for vehicles to pass, can be constructed as cheaply or cheaper than rails can be laid. Stations and freight houses as fine as any owned by the railroads can be erected with no more outlay than a railroad entails. As for rolling stock, just as comfortable passenger cars, just as powerful tractors and just as commodious freight cars can be provided by the motor industry of this country as anything now in use by our railroads. The cost of administration and power should be no more than that of any standard railroad and in all probability the use of numerous single units or trucks in tandem would demonstrate itself to be more efficient and economical than operation in trains.

The linking up of such a system with our present highways and those in contemplation opens up great possibilities for future developments along these lines and at the same time would bring into being a vast system beyond, in scope, that of any of our great railroads. If such a project could only receive the same amount of encouragement and actual aid as our great railroads have had there is no doubt that it would become as great an empire builder

in our undeveloped regions as any of the great railroads have been.

Until such a huge project comes into existence we shall probably limit the radius of activity of the motor truck to approximately one hundred miles, up to which point the motor truck has already shown its efficiency over the railroad in speed and in the elimination of hauling charges at either end of the haul.

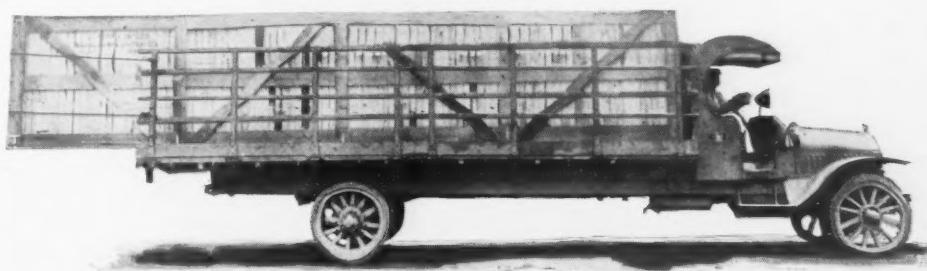
The versatility of the commercial car is beginning to be recognized more and more each day by those industries whose business it is to extract from the earth the raw materials that are so necessary to our daily life. There should be a great development in the way of motor hauling in the mining industry as these products are usually found in wild and remote districts and we can safely expect to find fleets of motor trucks handling metals from places which are inaccessible to the railroads, particularly as the hauling problem is considerably simplified by the presence of a constant daily tonnage.

Special Uses for Motor Trucks

It is predicted that the motor truck will in all probability replace the locomotive in the lumber regions in order to eliminate the danger from fire and added functions are being found each day for the motor truck in the oil industry.

Prompt and drastic action has been taken by the authorities of our Government looking toward an increase in food production in the United States. Although we have just had huge crops harvested in agricultural districts every effort is being made to make the next crop even larger. Since these increasing crops must be moved and the supply of horses is diminishing it seems logical that the agricultural districts of our country will become one of the biggest markets for motor trucks as well as tractors. No doubt there will appear in the market some type of vehicle for the farmer's use that will be adaptable to agricultural pursuits not only as a motor truck but as a tractor to work in the fields.

In truth there is a great future ahead of the motor truck and few of us, ten or twenty years hence, will recognize present-day hauling methods as anything but passe.



The Means Selected by the Standard Aero Corporation of New Jersey to Meet Their Delivery Requirements

This is a two-ton Mack chassis, with an extra long wheelbase of 200 in. and capable of efficiently carrying lengths up to 25 ft. Material of this length, such as aeroplane wings, assembled fuselages, etc., can be carried with an overhang of only 5 ft., when loaded on this truck. This small overhang prevents the dangerous "whip" of the tail end that is such a menace to heavy traffic. This extra length platform also supports the material carried through nearly its entire length, thus eliminating the stress that would ordinarily be placed on long, flexible material that would be obliged to droop over the edge of the truck for a length 10 or 15 ft.

Commercial Economy Board Urges Co-operative Delivery and One Delivery a Day Method

Suggestions are now being made by the Commercial Economy Board of the Council of National Defense at Washington to the retailers of this country, which will liberate a large number of men for war purposes and eventually result in much more economical delivery methods. According to the Board's study of the situation, at least 150,000 men are needlessly employed in delivery service. These can be released for war purposes and it will not be necessary for the merchants to call other men from the essential forms of work. Commercial cars can be used in place of slow horse delivery and a single route arranged by several merchants so that delivery can be made in a district by one vehicle instead of four or five going to that same district each day. Millions of packages which might just as well be carried by purchasers are now being delivered by the merchant. Here is where the housewives of America can assist in this work, first by planning their purchases so that special deliveries will not be required by foregoing the pleasure of having goods sent on approval and then returned, which is a useless waste; third, by carrying small purchases instead of having them delivered.

Due to a Governmental study of delivery, the following recommendation has been made by the Economy Board.

What "One Delivery a Day" Means

It does mean:

1. That no wagon or truck will go to the same house nor over the same route more than once a day.
2. That each vehicle may leave the store as many times a day as need be, but each trip will be over a different route.
3. That there will be a shorter average distance between stops, because all the goods that were delivered to a route on two or more trips will now be delivered on one.
4. That the territory may therefore have to be re-divided in shorter routes.
5. That even if the number of routes is increased and even if the vehicles make more trips, fewer vehicles and men will generally be required to handle the same volume of deliveries, because all duplication of work will be eliminated and density of stops will be greater.
6. That the total mileage will be less.
7. That gasoline, now in such great demand for war use, will thus be conserved.
8. That total depreciation on equipment will be less than with more deliveries a day.
9. That, for example, where Wagon A went three times a day over route A, Wagon B three times a day over Route B, and Wagon C three times a day over Route C, making nine trips in all, each route may be shortened, say a third, so that one of the wagons can make

all the deliveries on it in one trip a day, the trip taking up only half a day. Routes A, B and C may thus be redivided into approximately four new routes. Wagon A may make one trip over Route A and another trip over Route B. Wagon B may make one trip over Route C and one trip over Route D. Wagon C would be displaced entirely and its driver not needed.

It does not mean:

1. That all delivery vehicles will leave the store at one time.
2. That each wagon or truck will make only one trip each day and be idle after that trip until the next day.
3. That delivery men will have to work longer hours than when there are several deliveries a day. The hours of labor may be regulated quite as easily under the new system as under the old. The one-delivery-a-day plan may cut out late deliveries, thus in some cases shortening the delivery men's day.
4. That delivery work in the store will be more complicated. Rather the reverse will be true.

Government Postal Routes

During the fiscal year ended June 30, 1917, the United States Postoffice department operated 774 motor vehicle routes. The annual report of the postmaster-general shows that the department saved over \$320,000 by the use of trucks. To prove that the motor trucks can be depended upon for service, the following instance is cited: In one city, where government-owned trucks were operated during the entire year, 384,526 trips were scheduled. There were only 132 failures, that is, one failure to every 2913 trips.

The report of the postmaster-general says, in part: "It is desirable that existing legislative restrictions be removed and opportunity provided for the establishment of service by motor vehicle to rural communities that are entitled to better means of conveyance and communication with markets where produce may be disposed of to the best advantage, and where the farmer producer can be supplied with necessary implements and supplies through the mails without the loss of time incident to a personal trip to such market centers."

"Farm to Table" Routes

With the object of bringing producer and consumer together, the United States Postoffice Department at Washington is contemplating the introduction of a parcel post service between country and city districts. According to the plans under consideration trucks with a carrying capacity of not less than 1000 lb. will travel over roads radiating from Chicago as a center to points in the country 50 miles distant. The condition and serviceability of the roads will be tested before the routes are finally established.

Christian Girl, This Month's "Leader in the Industry"

(See Opposite Page)

From postman to president of a \$35,000,000 automobile parts making company in ten years is the record of Christian Girl. In addition to being president of the Standard Parts Co., of Cleveland, Ohio, he is very prominent in the accessory business. But just at present he has subordinated all these to accept a commission from the Government as Director of Production of the standardized military trucks in connection with the Quartermaster's Department of the Army. This responsibility came to him in consequence of his achievements in the manufacturing and business world.

Delicate as a child and studiously inclined, he was neither by nature nor habits developing physical robustness. Hence it was that he had to abandon, after two years, the career he started at eighteen of Methodist preacher. The combined necessities of earning a living and preserving his health forced him to seek manual employment with as much out of doors as possible, so he was at various times a water-carrier, street sweeper, laundry wagon driver, coachman and milk wagon driver, but always with an eye to something better. A position as letter carrier was the next step upward, for he easily passed the examination and obtained an appointment.

While still a mail carrier, he became acquainted with an old carriage spring maker, who had patents on springs. Recognizing in these, possibilities in the automobile field, he started what was then known as the Perfection Spring Co. It had a capital of only \$5000, and the shop was small and poorly equipped, but the product was well-received and the business grew until it was the largest of its kind in the world. Then the Standard Parts Co. was formed, taking it over, along with the Perfection Service Co. and the Standard Welding Co., was incorporated at \$35,000,000 and Mr. Girl chosen as president.

Although his history does not read like that of one with no ambition to be wealthy, it is a fact that money has no charm for him and he is interested in success only for its own sake. It was hardly a sacrifice for him therefore to relinquish his own business responsibilities while he turned his attention to getting out motor trucks for Uncle Sam at the rate of twelve an hour. It afforded an even more attractive outlet for his energies, considering that personal financial gain was no object to him, since it allowed him to go on accomplishing things with the added satisfaction of serving his country at the same time.

Commercial Car Changes

Announced Price Increases.

Hamilton Motors Co., Grand Haven, Mich.

Panhard A, 1-ton	\$895
Panhard B, 1½-ton	1095
Lange Motor Truck Co., Pittsburgh, Pa.	
Model C, 1-ton	\$1950
Model B, 2-ton	2650

Leaders in the Commercial Car Industry



Christian Girl

President Standard Parts Company and Director of Production, Military Truck Division,
Quartermaster's Department, U. S. A.

(See opposite page)

"I have always been interested in reading the 'Commercial Car Journal' and consider it one of the very good trade papers in the field relating to truck construction."

Christian Girl

Automobile Dealers Taking on Commercial Cars

Eighty per cent of all automobile dealers in the Shenango Valley are to-day selling some truck or other. While about ten per cent have been selling trucks for the past year, the other seventy per cent have taken them on in the last two months, and at least ten per cent more will be selling them in a short time.

R. H. Miller, agent for the Oldsmobile passenger car, of Sharpsville, Pa., recently took on the Bethlehem truck. No changes were made in the equipment. Mr. Miller has sold ten trucks in the past six weeks, which is doing well for a small garage in a small town, and goes to prove what can be done in this line. Mr. Miller contemplates a good spring season in the motor truck business. He advocates pneumatic tires for the front wheels, and on account of slippery streets where chains must be used, would have solid tires for the rear wheels.

Mr. Graham, manager of the Graham Motor Co., considers the truck a valuable addition to the automobile line and emphasizes the fact that all small town garagemen should get busy and take on a truck. He also recommends pneumatic tires on the front wheels to lessen the jar on the engine, and solid tires on the rear wheels.

The Shenango Valley Auto Co., of Sharon, distributor of Mitchell and Maxwell passenger cars, which last April moved into new quarters on North Main St., took on the Maxwell 1-ton truck in the fall. C. E. Davis, manager, explained that no changes were necessary in the salesroom or other equipment, and that he realizes this is the best move they have ever made, and their greatest asset in the automobile line at this time. Mr. Davis

has succeeded in getting good deliveries on trucks from the factory. He has placed a large Maxwell bus on the jitney line, running between Sharon and Farrell, which is making a record on gasoline and repair expenses. He advocates pneumatic tires on all wheels to lessen the jar on the engine, as well as on all parts of the truck or load in general. Mr. Davis declares that chains are not injurious to pneumatic tires if proper care and attention is given.

Motor Trucks in Demand as Food Carriers

Wherever a number of workmen are engaged in the large plants that are turning out war supplies or other material, the motor truck has been favored as the conveyance of food stuffs.

The Commercial Club of Farrell, Pa., at its last meeting advocated a motor truck produce line radiating from that city to farms within five miles of town. This action was brought about by embargoes that have been placed and the shortage

of produce cars resulting in a shortage of food stuffs for the men employed in the large factories at this point. It was the consensus of opinion that it would not only be a benefit to the consumers, but would also help the farmers who could grow more produce and secure a ready market.

F. S. Fish was appointed chairman of a committee to get in touch with Secretary Ross, of the Public Safety Committee of the State, and make arrangements for establishing motor truck service the coming spring.

Why New York is Short of Coal

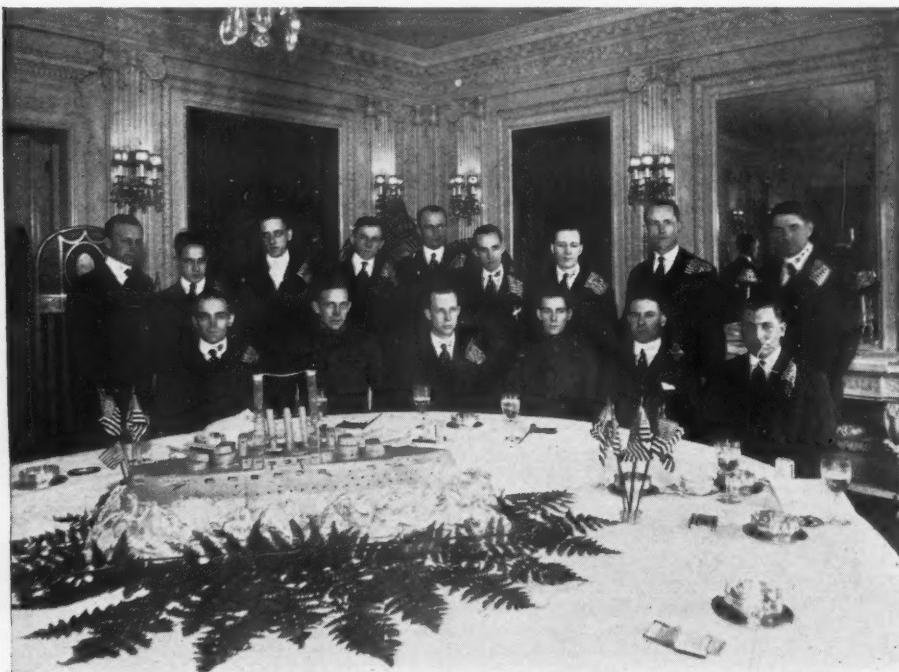
For the past several weeks New York City has been in the throes of the coal shortage which has extended over the whole eastern section of the United States.

The trouble was primarily understood to be a transportation situation, as there is and always has been plenty of coal.

A meeting was held at the office of Dock Commissioner Murray Hulbert on Thursday morning, January 24, which was attended by representatives of the various



Four-Ton Packard Truck Which Delivered Three Tons of Pyrenes From the New York Factory to the American International Shipbuilding Company at Philadelphia



Hyatt Roller Bearing Gives Enlistment Dinner in Honor of Two Employees

Employees of the Chicago office of the Hyatt Roller Bearing Company, assembled recently at a dinner in honor of two of their number who have joined the colors. J. E. Martin is already in service, being connected with the Mobile Ordnance Corps, located at Clintonville, Wis., and T. A. Russel, the other, has joined the Aviation Corps, and is now at the Aviation School at Ithaca, N. Y.

towing lines, coal dealers, the Fuel Administration, the City Government through Commissioners Hulbert and Delany and the Motor Truck Club of America, through President David C. Fenner and Secretary Theodore D. Pratt.

The situation apparently is due to the congestion and lack of unloading facilities and lack of ice breaking boats to combat the present severe weather. It was proved that at all times the transportation facilities had been sufficient to move the amount of coal that was dumped at the various unloading piers in New Jersey.

The situation lately has improved, as the unloading piers have increased the number of cars that they unload per day. This coal is being taken away from the piers as fast as unloaded.

The shortage of coal has not been a transportation problem in the sense that it is generally understood. It has not been due to lack of transportation facilities.

After the very clear explanation that was given, regarding the conditions, it was realized that there was no need of attempting to truck any more coal to New York than is being handled at present by this method and that the situation is well taken care of in the hands of the Fuel Administration.

Who's Who in Washington War Work

Organization of Government Committees With Which the Automotive Industry is Concerned

Automobile Industries Committee

509 Seventh Street, Washington, D. C.

A. W. Copland, chairman. Mr. Copland deals with matters connected with the supply of parts and equipment.

Hugh Chalmers. Mr. Chalmers represents the complete vehicle builders.

John R. Lee. Mr. Lee has been delegated by Henry Ford to look after the Ford company's interests in relation to the supply of war material, etc.

W. D. Rockwell is manager of the committee and any inquiry relating to the supply of raw material or factory capacity for undertaking government work should be addressed to him.

This committee is really the connecting link between the War Industries Board and the Automobile Trade and its position is such that it is in the closest possible touch with existing conditions from day to day. Any car or parts manufacturer needing information regarding government orders, etc., should communicate with Mr. Rockwell.

Highway Transport Committee

Munsey Bldg., Washington, D. C.

Roy D. Chapin, chairman.

Geo. H. Pride.

H. G. Shirley.

A. C. Hargreaves, secretary.

The primary duties of this committee are to facilitate the transport of Government war trucks from the factory to the coast by road and under their own power. These trucks are loaded with Government supplies and operated by men who thus gain experience in road transport which will be of immense value "somewhere in France" later on.

Part of the program includes the keeping of main roads in good condition irrespective of weather conditions and the full co-operation of the various State highway engineers has been requested and is being enthusiastically taken up by these officials.

It is probable that when opportunity offers this committee will take up the matter of road transport of goods from city to city, using trucks suited to the capacity of the individual load.

Inquiries on the subject of road transport or information as to local main road conditions likely to be of interest to the Government should be addressed to Mr. Hargreaves.

The Commercial Economy Board

18th and D Sts., Washington, D. C.

A. W. Shaw, chairman, is dealing personally with the various problems of eliminating waste in all branches of trade and manufacture. From an automobile point of view he is investigating waste in garages, repair shops, service stations, etc., and he is also interested in truck delivery problems and in the transfer of men from the (so-called) non-essential to essential services. Dealers who have ideas in connection with war-saving methods which can be carried out without interference with present efficiency should write Mr. Shaw.

The Aircraft Board

Munsey Bldg., Washington, D. C.

Howard E. Coffin, chairman, should be communicated with in the first instance in regard to any matter appertaining to airplanes, etc. There are many departments dealing with materials, supplies, etc., located at the Signal Corps Aviation Section office at 119 D St.

The War Industries Board

18th and D Sts., Washington, D. C.

Frank A. Scott, chairman.

Rear Admiral Frank A. Fletcher.

Hugh Frayne.

Colonel Palmer E. Pierce.

Bernard M. Baruch, raw materials.

Robert S. Brookings, finished products.

Robert S. Lovett, priorities.

H. P. Bingham, secretary.

This board is a sort of clearing house for the various committees which are in close touch themselves with manufacturers of all kinds of war material. It does not deal directly with the automobile industry, but acts through the Automobile Industries Committee. It is understood that Dr. Lovett, who issues the priority orders covering the transportation of coal, steel, munitions and goods, will in future co-operate more closely with the automobile industry through H. L. Horning of the War Board. Mr. Horning deals with problems connected with passenger cars, trucks and tractors.

The Council of National Defense

Washington, D. C.

The Secretary of War, chairman.

The Secretary of the Navy.

The Secretary of the Interior.

The Secretary of Agriculture.

The Secretary of Commerce.

The Secretary of Labor.

All boards and committees are in touch with the Council through the War Industries Board. Meetings between the various trade organizations are of daily or even hourly occurrence and the Council of National Defense is the final court of appeal in the event of ideas conflicting.

Postal Truck Route in Pennsylvania

Following the closing of a four-year contract for the transportation of the Philadelphia morning mail and morning newspapers from the South Bethlehem railway station to the postoffice at Easton, Pa., a motor truck will operate between these two points, meeting the train which arrives at the South Bethlehem station at 4 a. m. The truck will travel over the new William Penn Highway to the postoffice at Easton, arriving there at 5:15 a. m. The establishment of this motor truck postal route will greatly facilitate mail deliveries, as heretofore mail often remained at South Bethlehem (a distance of twelve miles from Easton) for hours, owing to the late running of the Lehigh Valley train, with which connection was made to take the mail to Easton. Any delay or interruption along the whole distance from Easton to Chicago

meant a delay in the delivery of Philadelphia mail for Easton, conditions being particularly bad during the winter months.

Ordnance Department Needs Several Thousand Civilian Workers

The United States Civil Service Commission, Washington, D. C., has issued a circular stating that the Ordnance Department of the Army urgently needs several thousand civilian workers, for clerical positions, and for testing, drafting and inspection, as well as some machinists and tool makers. The pay runs from \$1200 to \$2500 per year. All those who can take up positions of this kind are urged to write to John A. McIlhenny, president of the United States Civil Service Commission, Washington, D. C.

To All Dealers in Tractors or Automobile Dealers Who Contemplate Handling Tractors

We have something to send of great value. It will come to you in the nature of a pleasant surprise. If you are a dealer who belongs in either class, will you kindly send us your name and address and information as to whether you are at present handling or expect in the near future to handle tractors? If the former, state the make of tractor you handle; if the latter, tell us the kind and type of tractor you think you would like to handle. Address your communications to Tractor Editor, Chilton Company, Market and 49th Sts., Philadelphia.

U. S. Ball Bearing Now Strom Bearing

At a recent meeting of the board of directors of the U. S. Ball Bearing Mfg. Co. the following officers were elected: W. H. Strom, president and treasurer; E. N. Strom, vice-president; G. A. Strom, secretary. The change in officers was brought about through the death of A. A. Strom, who was president of the company, but in an advisory capacity only. Almost simultaneously with the death of Mr. Strom the company announced the change of name of its product from U. S. ball bearings to Strom bearings. The name was changed as a tribute to Mr. Strom's successful activities in the manufacturing world.

Motor Truck School at Camp Funston

The division authorities at Camp Funston, Kansas, in co-operation with F. P. Steinhauer, representative of the truck company which has supplied the majority of the trucks in use at the camp, have established a school for the training of mechanics to operate the army trucks. Mr. Steinhauer evolved the plan and offered his time and assistance in the establishment of the school. Many of the skilled mechanics, formerly at the camp, are now abroad, and since their departure, there has been a noticeable deterioration in the trucks. The measures taken for supplying this loss are therefore felt to be timely.

Friend Returns to Big Parts Company

Otis C. Friend, who was under contract with the United Motors Corp., and who was until recently president of the Mitchell Motors Co., has returned to the Big Parts Co., as vice-president. He had a very thorough knowledge of the Mitchell business, having grown up through the various departments of manufacture, purchasing and sales, occupying various departmental chairs until he became president. President Alfred P. Sloan, of the Big Parts organization, expressed his gratification at securing the services of Mr. Friend, whose ability and experience will be valuable to the company.

Acme Sales Conference

The general factory representatives of the Acme Motor Truck Co. met recently for their annual sales conference at the factory, at Cadillac, Mich. There were present at the conference a number of representatives of the manufacturers whose products are used on the Acme truck. The daily sessions were presided over by W. A. Kysor, president and general manager of the company, and C. J. Helm, sales manager. Acme production during the past year increased 300 per cent, and two large factory units were erected. In line with this increase in production quotas were established among the representatives at the conference calling for double the number of trucks manufactured in 1917.



Brockway Trucks in Connection With Trailers, Helping to Relieve Freight Congestion

The Maryland Motor Fast Freight Company, Incorporated, Baltimore, Md., transports freight between Baltimore and Washington, having purchased four Brockway three and a half ton trucks with bodies and enclosed cabs. In connection with these they operate three-ton trailers equipped with similar bodies.

Activities of the Motor Truck Association of Philadelphia

OFFICERS

J. D. HOWLEY
President

W. ROSS WALTON
Treasurer

EDW. W. BURNSHAW, JR.
Vice President

W. H. METCALF, Sec'y
328 N. Broad Street



BOARD OF GOVERNORS

LEE J. EASTMAN O. W. DOOLITTLE E. R. WHITNEY
J. HARRY SCHUMACKER THOMAS K. QUIRK

COMMERCIAL CAR JOURNAL OFFICIAL ORGAN

Patriotism Paramount at Motor Truck Club Dinner

THE feature event at the January dinner of the Motor Truck Association of Philadelphia at the Hotel Adelphia was the unfurling of a silk service flag with twenty-eight stars upon it. The number represents members of the Association who have gone into the service.

Thirteen of the twenty-eight men already are commissioned in various branches of the army. Major James W. Florida, long the Philadelphia representative of the Locomobile Co. of America, and Major Morris M. Kobler are in the Ordnance Department and are highest in rank of the men who have gone. Captain A. H. Santa Maria is in the Aviation Corps, and F. J. Little a quartermaster's department lieutenant.

The other Ordnance Department men are First Lieutenants John H. Rosen, former

Packard agent at Wilmington, and C. O. Raynsford; Second Lieutenants, Herbert T. Bassett, F. G. Gravelle, R. B. Black, J. M. Wellcox, Jr., T. V. Sproull, S. G. Woodbury and J. E. Hoppe.

Protests at excessive war "economies" were voiced by E. J. Cattell, City Statistician, who told the members that America would be weakened in the economic struggle to follow the war unless unwise economizing was abandoned. "We are in grave danger of cutting too close to the bone in our efforts to save for the good of the nation," he pointed out. "Instead, we are too apt to destroy the strength we will sorely need when the real struggle begins at the cessation of hostilities. Don't be carried away by the lure of saving; it is usually more expensive in the long run."

Major Wm. A. Garrett, formerly of the American railroad mission to France, pleaded for Governmental policies during peace that would prepare the railroads for

efficient war use. This, he said, was the secret of German efficiency with government operation of railroads. The operation of the roads by the United States would be of no value, he predicted, unless this end is kept steadily in view.

Chairmen of the committees made reports of the year's progress. The chairmen are: F. G. Browning, Entertainment Committee; Edward J. Burnshaw, Traffic Committee; Judge Eugene C. Bonniwell, Legal Committee; Charles E. Collard, Good Roads Committee; Thos. K. Quirk, Membership Committee; A. B. Shore, Publicity Committee, and H. P. Schade, Reception Committee.

John D. Howley, manager of the White Co. and the new president of the association, was toastmaster at the dinner, which was the largest in point of attendance ever given by the association. All the new officers were installed.

**H. H. Henry**

Who has recently been elected president and general manager of the Dart Motor Truck Company, Waterloo, Iowa.

**Milo D. Herron**

Recently appointed general sales manager of the Dart Motor Truck Company, Waterloo, Iowa.

**Major Wm. C. Barry**

Formerly general manager of the Selden Motor Vehicle Company, Rochester, N. Y., recently commissioned Major.

**F. W. Schwerdtseger**

Who has been appointed designing engineer of the Air-O-Flex Automobile Corporation, Detroit, Mich.

Personal Items

George M. Graham, assistant to W. J. Foss, second vice-president of the Pierce-Arrow Motor Car Co., Buffalo, N. Y., has been appointed chairman of the Motor Truck Manufacturers' Committee of the War Industries Board, with headquarters at Washington, D. C.

Clifford T. Abbe has been appointed district manager of the Washington, D. C., branch of the Little Giant Motor Truck Co., Chicago, Ill. He was formerly connected with the Stoddard Motor Car Co.

Norman Weber has been appointed city sales manager in Buffalo by the Atterbury Truck Co., Buffalo, N. Y.

Charles A. Swan, former superintendent of the Becker Steel Co. of America, has joined the sales force of the Hess Steel Corp., Baltimore, Md. He will represent the company in Cleveland and Detroit territory.

Samuel W. Gray (M. S. A. E.) has joined the Aviation Reserve Corps, with a commission as first lieutenant. He was formerly connected with Reed & Glaser, Indianapolis, Ind., consulting engineers.

Earl W. McGookin, Detroit, Mich., manufacturers' agent, will distribute the Tillotson carburetor, manufactured by the Tillotson Mfg. Co., of Toledo, Ohio, in the state of Michigan.

J. G. Jackson has been appointed district sales manager for Atterbury trucks in Il-

linois, Wisconsin, Iowa and Missouri, by the Atterbury Truck Co., Buffalo, N. Y.

R. D. Collins has resigned the vice-presidency of the Jones Motor Car Co., Wichita, Kans.

J. G. Cochrane has recently been appointed assistant general sales manager of the Savage Tire Corp., San Diego, Cal.

Edward Danner was chosen president of the Pan-American Motors Corp., Decatur, Ill., at a meeting of the board of directors of the company held recently. He succeeds A. H. Wyatt, recently elected president, who has resigned.

F. C. Van Cleaf has been elected secretary of the Republic Rubber Co., Youngstown, O. He succeeds Guy Norwood, recently elected president of the company.

Robert H. Scott, formerly connected with the Bessemer Motor Truck Co., is now district representative for the Dart Motor Truck Co., Waterloo, Ia., in New York and Pennsylvania.

E. M. McNamara has been recently appointed district sales manager for the Atterbury Motor Car Co., Buffalo, N. Y. He will have charge of sales of Atterbury trucks in western New York and northern Pennsylvania territory.

P. J. Degnon, sales manager of the Rowecalk Co., Plantsville, Conn., has been commissioned first lieutenant in the Motor Equipment section of the Ordnance Reserve Corps of the U. S. Army.

W. A. Murfey, formerly sales manager of the Hurley Machine Co., is now general sales manager of the Essenkey Products Co., Chicago, Ill., manufacturer of Essenkey tire filler.

H. E. Heyder, who for a number of years has been manager of the Brooklyn branch of the Polack Tyre & Rubber Co., New York City, has been appointed manager of western factory sales with headquarters at Detroit, Mich.

V. I. Shope has been appointed sales and advertising manager of the Zenith Carburetor Co., Detroit, Mich.

C. M. Hall, founder of the Hall Lamp Co., and recently of the Wetzell Hall Co., has been commissioned a major in the aviation section of the Signal Corps, and will be stationed at Washington.

J. C. Schmitz, formerly with the Metz Co., has been appointed district representative in Oklahoma and Texas by the Dart Motor Truck Co., Waterloo, Ia.

William Wield has recently been appointed assistant sales manager of the Fisk Rubber Co., Chicopee Falls, Mass.

C. E. MacConnell has been appointed sales engineer of the Hyatt Roller Bearing Co., Detroit, Mich. Mr. MacConnell was formerly connected with the B. F. Goodrich Rubber Co.

**Guy E. Tripp**

Former chairman of the Westinghouse Electric Co., now chief of the Production Division of the Ordnance Corps, and commissioned colonel in the U. S. Army.

**J. R. Coleman**

Who recently assumed the duties of factory manager in charge of production for the Selden Motor Vehicle Company, Rochester, N. Y.

**T. J. Manning**

Who has recently been appointed manager of the Philadelphia branch of the Polack Tyre & Rubber Company, New York City.

**C. M. Carr**

Who has resigned his position of managing editor of the American Garage and Auto Dealer to accept the presidency of the Planetary Roller Bearing Company, Chicago.

Harry F. Prescott is the new sales manager of the Disco Electric Starter Corp., Detroit, Mich. He was formerly with the Saxon Motor Corp.

Victor W. Klesrath, who for a number of years has been chief engineer of the Bosch Magneto Co., has acquired an interest in the Simms Magneto Co., East Orange, N. J., and will act in the capacity of consulting engineer for that company.

W. E. Dugan has been made factory manager of the United States Motor Truck Co., Cincinnati, O.

George Lane, formerly sales manager of the Parker Rust Proof Co., of America, Detroit, Mich., has recently been appointed general manager, succeeding Wyman C. Parker.

Frank R. Bacon, president of the Cutler-Hammer Mfg. Co., Milwaukee, Wis., has received the commission of major in the Ordnance Department and is at present supervising motor truck and gun carriage production at New Haven.

Guy E. Tripp, of New York, chairman of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been commissioned a colonel and appointed chief of the production board of the Ordnance Department of the U. S. Army.

Donald F. Whittaker, sales and advertising manager of the Detroit Truck Co., has resigned.

Lewis A. Disbrow, with temporary address at 1509 Michigan Ave., and permanent address, Railway Exchange Bldg., Chicago, Ill., is manufacturers' agent for Gile Motor Works. This motor will, in future, be known as the "Stearns," as a tribute to J. S. Stearns, of Cincinnati. Mr. Disbrow is also agent for the Disteele Wheel, made by the Detroit Pressed Steel Co., Detroit, Mich., in Illinois, Indiana and Ohio territory. The manufacture of the Disbrow speed car has been postponed until after the war.

Fred Wellman, former advertising manager of Olds Motor Works, will join the advertising department of the Moline Tractor Co., Moline, Ill.

Charles Spalding, former sales manager of Gisholt Machine Co., is now sales manager of the Amalgamated Motors Corp., Chicago, Ill.

New Agencies

W. M. Clement Motors Co. has been appointed distributor for Autocar motor trucks in eastern Nebraska and western Iowa, with headquarters at 2514 Farnam St., Omaha, Neb.

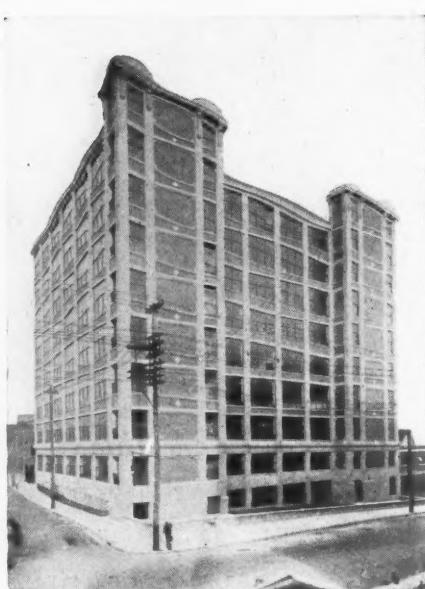
Acme Motor Truck Sales Co., 69 Adams St., Freeport, Ill., has closed a distributor's contract with the Acme Motor Truck Co., Cadillac, Mich., for the sale of trucks in northern Illinois, southern Wisconsin and Iowa territory.

T. C. Power Motor Car Co., Helena, Mont., will distribute Stewart trucks in Montana and northern Wyoming.

Cole Sales Co. of Indiana, Indianapolis, Ind., has taken the agency for the Kelly-Springfield motor truck in the 36 counties of central Indiana.

Butterfield-Bosch Co. has been incorporated recently and will handle the sales of Graham one- and two-ton truck units, made by Graham Bros Co., Evansville, Ind. The new company will have as exclusive territory, Butler, Warren and Preble counties.

Automobile Storage & Sales Co., 5919 Penn Ave., Pittsburgh, Pa., has been appointed distributor for Dart trucks in western Pennsylvania, northern West Virginia and eastern Ohio.



New Home of Electric Storage Battery Company

This building, recently erected for the Electric Storage Battery Company, Philadelphia, Pa., is eight stories high and of reinforced concrete construction throughout.

W. C. Norris Sales Co., Tulsa, Okla., has taken the agency for Gary motor trucks for the state of Oklahoma.

Western Motor Sales Co., Seattle, Wash., has closed a contract for the sale of truck attachments manufactured by the Western Truck Attachment Co., Seattle. This company will handle the entire output of the Western Truck Attachment Co. for the coming year.

Henley-Kimball Co. has taken the distributing agency for the Denby truck in New England territory.

Kansas City Selden Co., Kansas City, Mo., will distribute Selden trucks in the Kansas City territory for the Selden Motor Vehicle Co., Rochester, N. Y.

Jackson Motor Car Co., Worcester, Mass., has taken the agency for the Fulton truck for Worcester, Mass., and vicinity. The Fulton truck is made by the Fulton Motor Truck Co., Farmingdale, L. I.

Indiana Selden Sales Co. has been formed at Indianapolis to distribute Selden trucks in that city and the seven surrounding counties.

Vim Truck Co., Fresno, Cal., will handle Vim delivery cars in Fresno and vicinity.

Smith-Glines Sales Co., Detroit, Mich., has taken the distributing agency in Detroit for the Collier truck, made by the Collier Motor Truck Co., Bellevue, O.

Pittsburgh-Paige Co., Pittsburgh, Pa., has been appointed distributor for Diamond "T" trucks in western Pennsylvania and eastern Ohio.

Union Motor Truck Sales Co. will have charge of the sales of all Union trucks, with headquarters at Chicago, Ill. Union trucks are made by the Union Motor Truck Co., Bay City, Mich.

Detroit-Duplex Sales Co. has been organized at Detroit, Mich., to distribute Duplex trucks in Detroit.

Hyde Motor Co., Bloomington, Ill., has contracted with the Nash Motors Co., Kenosha, Wis., to handle its line of commercial trucks.

Removals and Trade Changes

Imperial Machinery Co., Minneapolis, Minn., has been taken over by a new corporation known as the Imperial Machine Co.

C. W. Moore Mfg. Co., Detroit, Mich., has changed its name to the Princess Mfg. Co. and increased its capital from \$2000 to \$200,000.

Motor Specialties Co., Waltham, Mass., has purchased the factory of the Hutchings Organ Co. Thirty thousand square feet of floor space will be available in this building and enlarged quarters will enable the company to care for increased production.

Bliss-Chester Co., Providence, R. I., manufacturer of battery supplies, announces that its business will hereafter be conducted as a corporation under the name of the Patton-MacGruer Co.

Vulcanized Products Co., Chicago, Ill., will in future be known as the Curtis Tire & Rubber Co. The company has increased its capital stock from \$200,000 to \$1,000,000.

Rands Auto Co., distributor of Selden trucks in Philadelphia, has removed from 1805 Market St. to larger quarters at 18th & Market Sts.



Assembly Department at Plant of Wisconsin Motor Mfg. Company, Milwaukee, Wis.

The assembly department, which includes a subassembly and final assembly plant, with a shipping department and stock room, was erected recently by the company. These new buildings, together with a brass foundry, also a recent addition, will enable the company to quadruple its production of tractor, truck, passenger car, motor boat and aeroplane engines.

A Way to Relieve Freight Congestion

Have Railroads Deliver Freight Directly to Consignees and Keep Rolling Stock Moving and Terminals Clear

[The following letter has been sent to newspaper editors, members of commerce, boards of trade and commercial clubs in every city in the country of 25,000 inhabitants or more, by H. B. Larzelere, Vice President and General Manager of the Vim Motor Truck Company]

IT is costing the manufacturers of this country \$765,665,600 in goods and the working men \$160,476,850 in wages to learn that our transportation facilities cannot be stretched one hundred per cent and still permit individual shippers and consignees to follow their selfish interests regarding the handling and delivery of goods in transit.

The chaotic condition in which we find our railroads today—the fact that freight lines, express companies and mail routes are swamped—is not due to severe weather conditions alone and a mere return of mild weather will not help matters. It is not due to a shortage of coal.

It is due to a clogging of distribution channels—the laying up of cars which should be in transit—congestion at railroad terminals. It will not be cured until some practical means is found to keep these channels clear and to route freight through the terminals rather than to them.

Our business men must heed the general call from the Federal Government for help in this matter which has now become a serious one.

Railroads have always delivered less-than-carload freight to their own freight platform and let the individual consignee call there for it, or have an individual expressman call.

Express Company Practice Right

The national express companies like Adams, American, Wells Fargo, etc., have their own express platforms where their goods are classified immediately upon being unloaded from the express car and are transferred into their own trucks which take them either to distributing stations or directly out on certain routes.

It is perfectly practical to so organize freight distribution beyond the terminal that this could be done with freight as well as express consignments.

Consider for a moment what would happen if Uncle Sam refused to deliver any mail in any first-class city.

The post office building would have to be materially increased in size and would have to have quite as many employees as now if not more.

Probably 90 per cent of the families in that city would have to have their representatives go to the post office. They would use street cars and other public conveyances. Think of the trouble and cost and the extra tax on street car lines and public service facilities.

The cost to the Government on account of congestion would be considerably more than at present and in all probability they would be unable to handle the mail at two cents an ounce, or now three cents.

Undoubtedly, the cost to all concerned would be enormously increased, and any

move on the Government's part in this direction would meet with public disfavor.

Nevertheless that is the way railroad freights are handled today. And they are handled that way simply because that is the way it has always been done and because the transportation and terminal facilities have been considerably more than adequate to take care of normal business.

Again, there is no more reason why freights should be stopped at the terminal than that mail should be stopped at the terminal.

Before Government control of the railroads was put in operation there might have been certain practical objections to the carrying out of a system to take over the delivery of all less-than-car-load freight to the consignee.

Although the Government has no organization to take on this work at the present time, it is so important from the standpoint of the manufacturers of this Country that it would be perfectly proper for them to take action in their own duly authorized bodies.

To men familiar with merchandise delivery products, the course to be taken is perfectly simple.

It would be necessary to requisition local express delivery companies now existent.

By proper sorting of the freight and proper routing of the city, duplication of routes and the hauling of "part loads" which are so common at the present time would be entirely eliminated.

Co-ordinate, route, and systematize the express delivery lines and stop the duplication of routes.

This would relieve the highways of unnecessary vehicles.

It would relieve the freight terminals of freight congestion.

It would release freight cars that now have to be stored in the railroad yards awaiting their opportunities to get to the freight platforms.

It would give better and cheaper service to local merchants. It would enable the railroads to serve the whole Country far better than they can at the present time.

Undoubtedly Government action or a matter of this importance will come in time, especially as the need for it is getting more acute.

Nevertheless each city can take its own action and reap the benefit of immediately cleared terminals at once in its own section.

Each city will have its own particular problem to work out; there is nothing new in the principle.

A co-operative organization may be started as small as the limitations of the situation make necessary. A half dozen merchants might consolidate their deliveries

and have all their vehicles superintended by one man stationed at the freight platform.

More members could be added, and should be, as rapidly as possible until the work is so organized that your association with the approval of your city government has taken over the inbound freight platform and piers, sees that less-than-car-load freight is transferred from the freight car directly to the truck that is assigned to the route on which the consignee is located.

The savings to the individual members of your association in service of this sort will be considerable and since it is fundamentally right, any section in which it is placed as an emergency measure will probably continue it as permanent after the war.

As to the details of organizing co-operative freight transfer work, we should be glad to do our "bit" by giving you the advantage of suggestions from our Traffic Engineering Department without any obligation whatever to you.

Auto Industry in Italy

Unlike the motorcar factories of England and France, Italian automobile factories have been allowed to continue the classes of work for which they were originally designed. In no case has a motor factory been converted from motor work to the manufacture of shells or other war materials having no direct connection with the motor industry. The entire output of the factories is for military purposes, and the production of passenger cars has necessarily been curtailed, but Italian factories have been greatly increased in size. They have now a greater car output than at any period in their history and have increased at a greater ratio than those of other allied nations. The largest concern is Fiat and other important factories are those of Lancia, Spa, Itala, Ecat, Diatto, Bianchi, Isotta-Franchini and Zust.

An Italian dealer gives several reasons for his belief that there will be a still greater demand for motor trucks after the war. The development of country bus lines will necessitate large purchases of commercial vehicles, he thinks, and since the war has given an impetus to the utilization of motor trucks for the industries, the use of trucks and trailer trains in the flat industrial countries of Lombardy, Piedmont and Venetia is assured, as the roads are, on an average, better than American roads. Public services and utilities, which have operated under overstrained conditions during war time will have to renew a good part of their equipment: fire department trucks, street cleaning and repair service trucks, electric traction and aerial transmission repair trucks, will all be needed.

Motorized Dentistry for Army

AMOST interesting exhibit at the Cleveland Automobile Show was the dental motor car, the first completed unit of a fleet that will be sent to France for service behind the lines.

Several months ago S. Marshall Weaver, D.D.S., of Cleveland, proposed to the Cleveland Chapter of the Preparedness League of American Dentists, that they design, equip and present to the Government, a dental motor car. This was favorably acted upon and the offer was made to the Council of National Defense, being the first official offer of dental motor cars made to the Government. This was referred to the sub-committee on dentistry of which Major Logan is chairman. He appointed Drs. S. Marshall Weaver, Harvey J. Burkhardt, Chas. F. Ash and D. H. Ziegler as a committee to design and equip a motor dental car for the Government. Plans and specifications were immediately perfected, details and photographs were presented to the Defense Committee on Dentistry and accepted.

The chassis of this dental car is a model 16 GMC, the body and equipment being constructed by the Brown Auto Carriage Co. of Cleveland.

The body is $6\frac{1}{2}$ ft. high x 6 ft. wide x 9 ft. long and it constitutes the main

operating room and laboratory. The tail gate makes an extension of 3 ft. floor space and the top section swings upward and serves as a roof. This allows the operating chair to be located at the extreme rear of the body proper. During cold or stormy weather this extension is enclosed by heavy canvas walls. Heat and light are furnished by kerosene, acetylene gas and storage battery. The latter also furnishes power for the dental engine and lathe. A 30-gallon tank supplies hot and cold water, it being filled by a rotary hand pump, a filter furnishing pure water. There is a compressed air tank, sterilizer, vulcanizer, lathe and gas appliance for anaesthesia. Specially fitted cabinets contain a complete set of instruments and supply of materials. A folding desk, typewriter, file for records and dental library are also conveniently located.

The tents on each side of the car are substantially built and thoroughly weather-proof. Each tent is equipped with a portable operating chair, portable dental engine, instrument case and field stand. When in transit the tents fold and are carried on the side of the truck.

Five men accompany each car, four dentists and a driver. Living quarters for the operating staff are in the tents. Personal lockers are provided in the body proper.

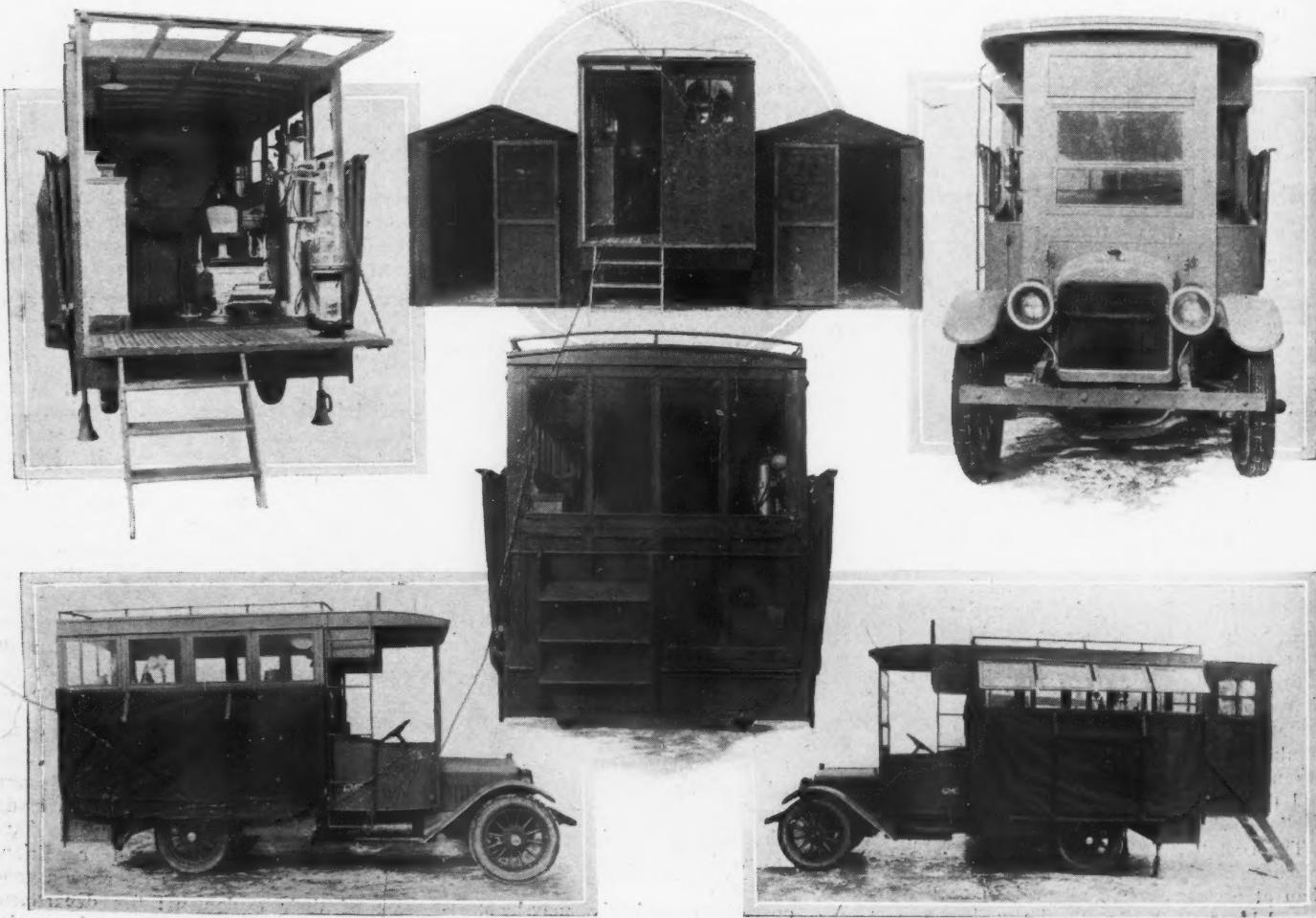
The driver lives in his cab, which is sufficiently roomy for comfort.

Heavy mica lights, in place of glass, are used throughout, those in the tents being ingeniously fastened with snaps to allow for quick replacement in event of breakage. An extra set of window lights accompanies each car.

There are several more cars in process of construction at present. While no specific estimate can be made now as to the number that will be built, it is sufficient to state that the fleet will be quite large.

The Preparedness League of American Dentists have successfully motorized dentistry and they are doing their bit by presenting the complete equipment to Uncle Sam and his boys.

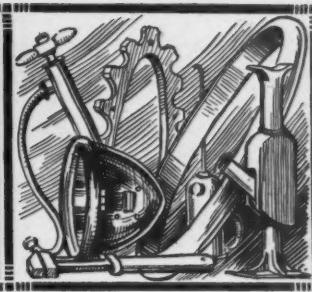
Four Parts Makers Combine.—Bowen Mfg. Co., Auburn, N. Y.; Zerk Mfg. Co., Cleveland, O.; Wiskley Co., Detroit, Mich., and Canadian Wiskley Co., Windsor, Ont., have merged, and the new concern, capitalized at \$2,500,000, will be known as the Bowen Products Corp., of Auburn, N. Y. The plants are at present chiefly engaged on government work.



Different Phases and Positions of the Dental Motor Car That Was Exhibited at the Cleveland Auto Show. This Was Designed, Equipped, and Presented to the United States Government by the Cleveland Chapter of the Preparedness League



TRUCK ACCESSORIES AND APPLIANCES



New Eisemann Magneto-Generator Unit Easily Installed

The Eisemann Magneto Co., of Bush Terminal, Brooklyn, N. Y., has announced its new two-in-one unit, composed of a magneto and a generator, the latter being mounted upon the former, and being detachable from it without interrupting the operation of the car. In installing this new unit on a magneto-equipped car the same magneto driveshaft is used, the same bracket and even the same screws, thus making it interchangeable with any standard magneto and facilitating the installation of a generator and new magneto. Accessibility and independence of operation of these units are features of this new product, and as well fact that the unit occupies practically the same space a magneto alone.

General Description of the Units

The magneto and generator are two distinct and independent machines. The magneto has a permanent magnet field and that of the generator is strictly magnetic. The generator is directly above the magneto and is driven through a train of three gears. To secure a noiseless drive, the teeth are cut helically and the intermediate gear is of non-metallic material. The intermediate gear also drives the distributor disc, eliminating additional parts, yet being in strict conformity with advanced magneto practice. The complete machine, wherever necessary, is not only accessible, but where adjustments are required, means are provided for making them.

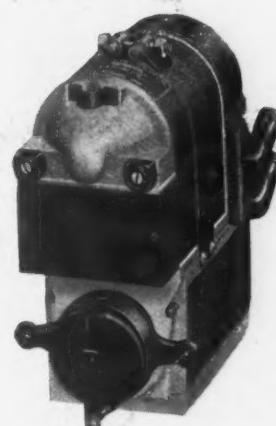
The construction is such that the generator can be easily removed without interfering with the operation of the magneto. The generator is driven at a speed 1.77 times that of the magneto.

The location of the distributor is an innovation in ignition practice. It slides between the base of the generator and the magneto end plate, yet it is waterproof in construction and conforms with approved practice, firing each cylinder separately and affording accessibility to collector ring, distributor and distributor disc. The distribu-

strongest Eisemann magneto and that the normal output of the generator at 1200 r.p.m. is 80 watts, the compactness is marked. The maximum current of the 12-volt machine is 6 amperes, while that of the 6-volt is 12 amperes.

This small "two-in-one" apparatus, although very accessible, has not been slighted in material or workmanship to make it complete, sturdy and reliable. Aluminum has been used wherever feasible, giving strength and reducing the total weight to only 24 lb.

The Eisemann magneto needs no introduction. Large details, such as the distributor firing each cylinder separately, and small refinements, as, for example, the timing mark shown on gear cover, have not been overlooked.

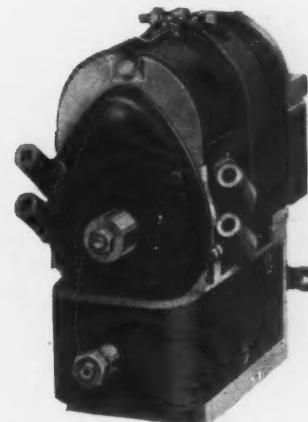


Breaker-End of Two-In-One Unit

tor terminals are ingeniously constructed to meet the conditions of utilizing small space, being easy to remove and yet being waterproof. This is accomplished by the terminal having a dove-tailed groove, sliding on a corresponding lug on the distributor block and making the contact, as well as being held in place, by a bronze ball catch.

Annular ball bearings are used on both the magneto and generator armatures, and oilers are located on both sides of the machine.

Considering that the ignition unit is practically made up of all standard parts of the

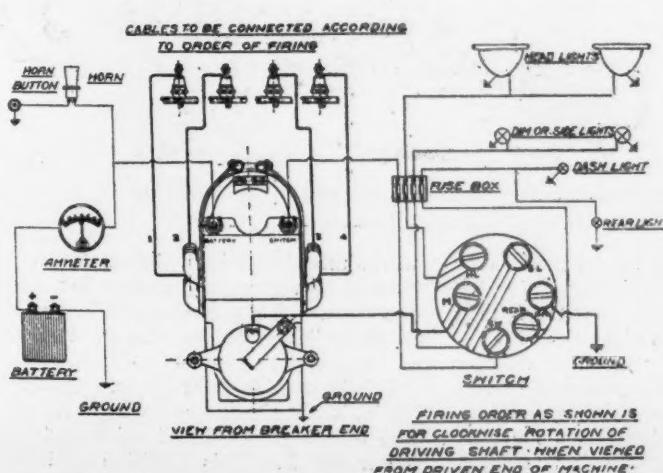


Driven End of the Eisemann Product

The generator, as stated herein, is an absolutely independent unit, its excitation being electro-magnetic. It is made for 12 and 6-volt systems. The use of a generator strap, in conjunction with six dowel pins between the two units, allow the generator to be easily removed by prying with a small screw driver in slots, provided for the purpose, and without interfering with the operation of the magneto.

The generator field coil is coil-wound with the shunt coil normally exciting the field. When the lights are on, both the series and shunt are exciting. A very substantial and compact cutout is built in the machine just beneath the generator terminals on the breaker end of the machine.

Every part which requires occasional attention is easily accessible. The brushes and commutator can be readily examined and if, for some reason, a new adjustment is required on the cutout, the cover can



Wiring Diagram of the Eisemann Magneto-Generator Unit.

be easily removed and a change made by means of the regulating screw.

The switch panel consists of a high grade three-point lighting and ignition switch, complete with a flush type ammeter. A King key and lock controls the magneto ignition in the customary manner. The panel is dull black, while the switch and ammeter are nickel plated. The ammeter scale for the 12-volt machine is 10-0-10, while that of the 6-volt is 15-0-15.

Parry Brings Out Farm Bodies

Bodies especially adapted for farm use have had an increased demand due to a great extent on the call for greater food production to meet the needs of a fighting world. Appreciating this demand, the Parry Mfg. Co., Indianapolis, Ind., has designed two new models for Fords, No. 508 and No. 514. The former is adapted to hauling all kinds of farm products, such as grain, loose or sacked, potatoes, onions, corn, etc. The racks are so designed that ears of corn cannot fall out.

The No. 514 platform body is especially suitable for hauling stock. It may, however, be used for hauling sacks of grain, milk cans, crates of vegetables or fruit, etc.

The regular equipment of the No. 508 body includes the express body, a No. 50 cab with a full width cushion and an upholstered back, and the stock racks complete. The body has a loading space 45 x 110 in. The width between the racks is 66 in. The height from the floor to the top of the racks is 52 in. The floor and sills are protected by steel strips. Substantial braces are used throughout and the end-gate is ironed and equipped with a chain. The color in which the body is painted is light green. Its net weight is 850 lb.

The No. 514 platform body is spaced and has a carrying capacity especially suited to hauling stock. All the racks are removable and have clasps at each corner to hold them rigidly in place. The regular equipment is

When equipped with the racks these bodies are suitable for hauling hay, fodder or for any general farm use, the floor being grain-tight and capable of carrying capacity load. Of these models, No. 615 is the one designed for the Ford Ton Truck, it being offered without the racks as No. 614.

No. 615 body is well built, strong and durable, being built for hard service and exposure to the weather. It can be furnished with No. 52 All-Season Cab at extra cost, and it can also be had without the standard cab if desired. The dimensions back of the seat are 60 x 94 in. The body panels are 16 in. high inside and the floor has steel protecting strips. The capacity of the body is over 40 bushels of loose grain. Supporting sills are of seasoned hardwood and stock racks stand 48 in. above the floor and are held firmly by long



No. 414. Parry Farm and Stock Body
This is the same as the No. 415 body except that it is furnished without racks

rods through front and rear. The heavily ironed drop end-gate has long chains and four wrought hinges. The finish is green, with striping.

The convertible farm body for the Ford Model T chassis is No. 415, without the racks being No. 414. The feature of this model is its ease of mounting, being lighter in weight than the previously described

Wohlrab Steering Gear

The Wohlrab Gear Co., of Racine, Wis., has been incorporated under the laws of Wisconsin for \$75,000 to manufacture steering gears for all makes of automobiles, commercial cars, and tractors. The officers of the company are: P. B. Wohlrab, of Racine, president; E. M. Saskey, Racine, vice-president; E. H. D. Smieding, secretary; J. G. Kluyskens, New York, treasurer. Every officer is an experienced steering gear man.

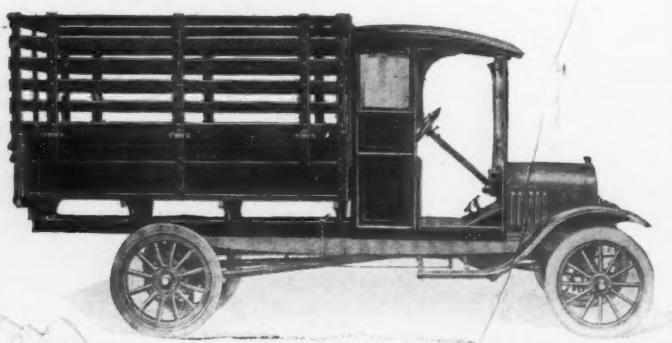
President Wohlrab's steering gear experience dates back to the early days of the old Lozier Motor Car Co., who made their



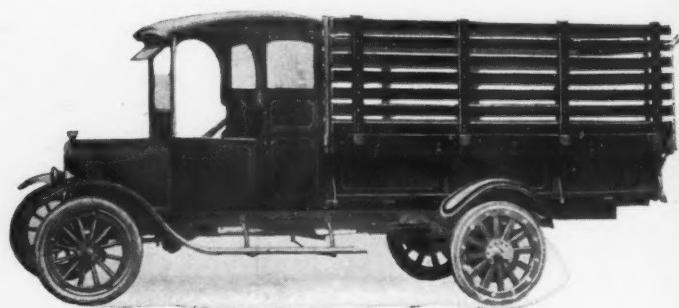
The Wohlrab Steering Gear and Its Parts

own gears. Mr. Wohlrab, as production manager of that company, became much interested in the steering gear construction and development. Later as vice-president and engineer of the Lavine Gear Co., he developed their A W and B W models.

The new Wohlrab gear is patented. One of the outstanding features of this steering gear is that all working parts continuously operate in oil. The parts can be removed from the housing without removing the latter from the car. All wear can be taken up without disturbing the internal parts and each and every part retains its original and normal position and functions the same as when new. Other features are ease of adjustment for wear, and absolute interchangeability of parts. The load on the



At the Left is No. 615, "All-Season" Parry Body for the Ford One-Ton Truck Chassis, and at the Right the No. 508, Parry Convertible Farm Body for the Ford Extension Chassis



similar to that for the No. 508 body. A loading space of 60 x 112 in. provides ample room for stock transporting. The extension cross sills are bolted to the longitudinal sills. The finish is in orange with appropriate striping. The net weight is about 750 lb.

The Parry line has also been broadened by the recent addition of two convertible farm bodies, one for the Ford truck and the other for the Ford model T chassis.

body. It is designed to be put to the same uses as No. 615, but is intended for less severe service. It is ideal for hauling milk, fodder or cattle. It has dimensions back of the driver's seat of 60 x 70 in. It also has a grain-tight floor, floor-protecting strips, panels 12 in. in place of 16 in. Its capacity is 24 bushels. Other details are the same as No. 615, except that the drop end-gate has three hinges in place of four, and is equipped with short chains.

worm tube is perfectly balanced. A long parallel worm contact makes for smooth operation. The gear is made in five sizes from the light auto to the heaviest truck.

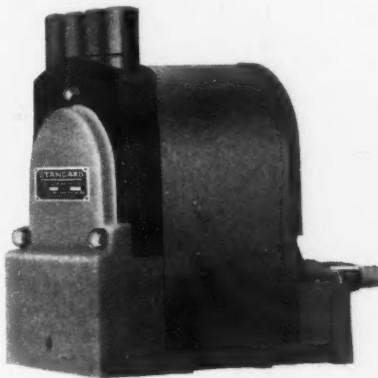
Continental Motors Corp., Muskegon, Mich., is erecting an addition to its plant. The building will be of brick and steel, 400 x 180 ft. This addition will mean the employment of at least 300 more workmen.

Standard Magneto Features Durability and Few Parts

The Standard Ignition Co., of Elkhart, Ind., has announced details of its high tension magneto, which disclose a well-constructed and durable instrument designed for passenger car, commercial car and tractor use. The features of this new product are the small number of parts in its composition and the modern construction throughout.

The magnets of the Standard high tension magneto are heavier than any other magneto of this class on the market today. By actual test, it has been found that were the magnets of some well known magnetos heavier, much better results would be obtained from these magnetos after long periods of operation. There are no holes bored through the Standard magnets and they are made to fit tight over the pole pieces, thus preventing any vibration of the magnet terminals.

The drive end frame, the pole pieces, the base, the cover plate over the armature and pole pieces, and the drive-end bearing, are cast in one piece. This construction eliminates a great number of screws, nuts and



The New Standard High-Tension Magneto

bolts usually employed in this portion of a magneto. It insures standard assembly of all of these parts and reduces the number of parts required for the magneto to a considerable extent.

This die casting is machined in jigs, insuring interchangeability. The circuit end frame is fastened to the pole pieces by four heavy screws which are located by jig. The circuit end frame performs no other function than to carry the distributor block and circuit end bearing of the armature, and also carries the circuit breaker plate.

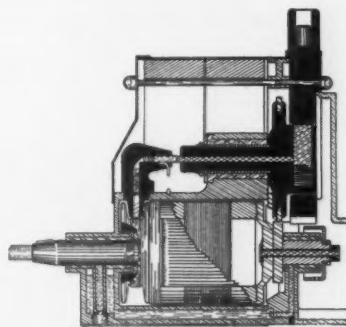
The circuit breaker is mounted on a plate fastened on the circuit end die casting. The platinum point arm rocks on a heavy pin mounted on the plate; a mild spring closes the circuit-breaker. The circuit-breaker points are adjusted by sliding the stationary point up or down without turning it. This prevents the necessity of making a new seat every time points are adjusted, greatly reducing the possibility of excessive sparking and insuring the greatest possible contact at all times. Since the circuit-breaker mechanism is mounted on a stationary plate, it can be observed during operation, even adjusted while in operation.

To repair the condenser it is not necessary to take the entire magneto apart. This is because the condenser is contained within a brass case which sets in a recess alongside of the circuit breaker and is held in place with one nut. It can be removed by taking off the nut which is but a moment's work, and nothing else need be disturbed. The distributor block of the Standard high tension magneto is made of extremely heavy moulded Condensite. The segments are long, and there is absolutely no arc at the distributor brush, leaving the segments, or approaching them, no matter whether the magneto is running at full advance

may be removed while the magneto is in operation, and its action observed.

The spark advance accompanies variation of spark by changing the angular position of the armature shaft to the driving shaft, and has a range of 45 deg., thus the circuit-breaker opens always at the high-wave moment of the magneto, and full electric output of the magneto is obtained at full retard and full advance and all intermediate positions.

The Standard magneto is on exhibition at 345 People's Gas Building, Chicago, Ill. The factory is located at Elkhart, Ind., the Standard Ignition Co. being the maker.



Section View of the Standard Magneto

or full retard. The distributor brush revolves within the distributor block and is held in a socket which is moulded integral with the distributor gear and shaft. The distributor brush holder, distributor gear and shaft being moulded in one piece eliminates many separate parts and a great number of bolts, nuts and screws. The high tension conductor passes through the center of the Condensite shaft. This also eliminates another separate part. A steel sleeve surrounds the Condensite shaft and provides the bearing surface of the shaft. The distributor shaft revolves in a graphite impregnated bearing which does not require lubrication.

The armature of the Standard high tension magneto is of the compound-wound type, which when complete, is impregnated in an insulating compound under vacuum and pressure. The armature is capable of withstanding a temperature of 280 deg. Fahrenheit, without depreciating its insulation.

The diameter of this armature is much greater than any other, which permits the correct proportion of primary and secondary winding in order to insure correct electrical performance.

All of the insulating parts are made of Condensite. No rubber is used.

It must be conceded that much better magneto performance would be obtained were very magneto properly lubricated. Since it is impossible to be certain that the oil can is applied with any degree of regularity, and as lubrication is absolutely necessary, this magneto has been provided with automatic lubrication. The oil reservoir, which is below the bearing, contains sufficient oil to lubricate the magneto for an indefinite period.

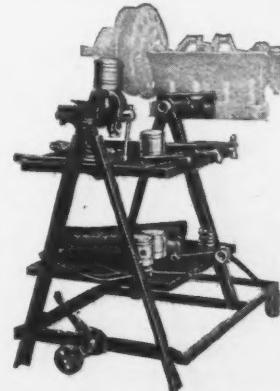
The magneto is thoroughly covered to prevent dust and moisture from getting at any of the working parts, and the covers

Ekern's Portable Workbench and Engine Stand

This outfit is the latest production of the maker in the way of work benches and embodies the features of a work bench and engine stand combined. It is especially designed for use in Ford repair shops, although there are many uses it can be put to in general repair shops as well.

It is provided with two large trays 22 x 24 in. for convenience, where the workman can place his tools, engine and axle parts. The stand is mounted on three 4-in. diameter wheels. The rear castor wheel is so constructed that, by pulling the plunger Jim, the castor will swing up off the floor and the stand will then rest firmly on its legs. By kicking the castor lever down, the stand will go back on its wheels and lock automatically.

A Ford assembly can be fastened to the stand by the two cap screws which hold the water inlet connection on the side of the engine block. The part fastened to the engine will revolve in the clamp on the stand,



Ekern Combination Portable Workbench
and Engine Stand

throwing the engine in any position or angle where it can be retained by tightening the clamp screw.

The bench is also equipped with a machinist's vise which has a 3-in. jaw with a 4-in. opening. This will handle any work required in overhauling a Ford engine or axle or other work of similar nature.

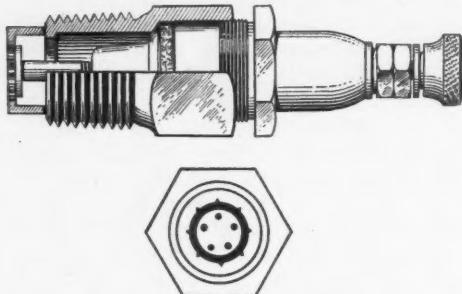
The Portable Work Bench and Engine Stand is 36 in. high and has 27 x 42-in. floor space; weight, 120 lb.; list price, \$40. The axle attachment can be used on this bench. It is made by the Ekern Bros. Mfg. Co., of Flandreau, S. D., and distributed by H. G. Paro, 1410-12-14 S. Michigan Blvd., Chicago, Ill.

Derf Spark Plugs and Gripwell Pulley Covering

Three very interesting and brand new products are being handled by the Sales Service Co. of New York, 13 Water St.

The Derf Spark Plug

This plug is manufactured by the Derf Manufacturing Co., of 90 W. Broadway, Cor. Chambers St., New York City. The feature of this plug is that the center electrode terminates in a flat disc. The shell of the plug is notched as clearly indicated by the illustration. This combination insures innumerable spark points, as the current can jump across the gap at any point around the circumference of the disc. This plug lists at \$1.50 and can be supplied for any make of truck. It is



Cutaway and Sparking Point Views of the Derf Plug

claimed this plug will burn away oil and fire under adverse conditions.

Gasoline Tonic

Under this trade name the Standard Chemical Co., of Los Angeles, Cal., is manufacturing a liquid chemical which is added to the gasoline and is claimed to produce more mileage and less carbon. One quart will treat 200 gals. Prices are \$2.50 per quart; \$7 per gallon; 5 gals., \$30.

Gripwell Pulley Covering

This material is manufactured by the Gripwell Pulley Covering Co., 157 Cedar St., New York City. This composition is a vegetable and oil compound of great adhesive power. It is applied to the belt and left to dry for four to six hours, after which time the belt is ready to operate under load. In connection with this compound the makers use a specially prepared canvas which is applied to the pulley. It is of such character that it is rendered exceeding porous and capable of absorbing and retaining the maximum amount of "Gripwell," (which is applied in a liquid condition) and dries with great hardness, leaving a semi-elastic, slightly rough, leather-like surface which enables the belt to exert its maximum amount of power, without necessitating the belt being tightened or the use of idlers.

The peculiar chemical properties of "Gripwell" when painted on the outside surface of the canvas covering contains valuable ingredients such as Neatsfoot and Castor Oils, a combination known as a preservative which penetrates the leather, making and keeping the whole belt pliable, and in best possible physical health, preventing all drying or cracking.

In other words "Gripwell" is a two-in-one compound. It is used for cementing

the prepared canvas covering firmly to wood, fibre or metallic surface of the pulley and acts as a dressing for the belts.

This product is put up in cans of 5, 10, 20, 50 and 100 lb. It sells for \$1.25 per lb. A 5-lb. can of "Gripwell," 4 ft. of 12-in. specially prepared canvas and a wood scraper, lists at \$5.50. A 10-lb. can, and 8 ft. of 12-in. canvas and wood scraper sells for \$10. The canvas can be purchased in all widths from 4 in., advancing by 2 in., up to 24 in., at from 10 to 35 cents per ft.

"Comoncense" Economizer

The "Comoncense" economizer is a device which heats the air before it passes into the carburetor for mixing with the fuel to the temperature which obtains during summer months. This is accomplished by inserting between the flexible tube, which ordinarily carries the hot air from the exhaust manifold to the air intake of the carburetor and the air intake of the carburetor, this "Comoncense" heater. The air is therefore carried through a chamber where it is sufficiently heated by hot wiring.

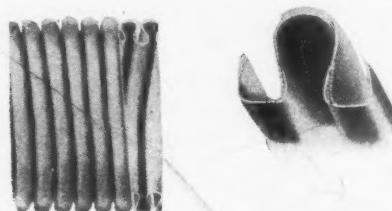
Titeflex Metal Tubing

The Titeflex Metal Hose Corp., of 120 Broadway, New York City, is specializing in a line of metallic gasoline hose for use on pumps and tank wagons. It is made on a new principle. The seam is compressed under heavy pressure, making a rigid, solid and perfectly tight cold welded joint. The metal between the joints is in the shape of a "U" and forming a series of convolutions. The flexing in the tube is taken care of by the metal itself and not by the joints. This construction is plainly seen in the illustration.

This tube is practically indestructible as it contains nothing but metal. It does not



The "Comoncense" Air-Heating Device With and Without Enclosure



Sections of the "Titeflex" Metal Tubing

depend on packing of any kind for tightness. Another feature of this tube is that it can be soldered on to a coupling very easily.

Titeflex being spiral can be screwed into the thread of the terminals, and the latter will fit without soldering, but when soldered the tubing can be applied under high pressure.

It is made in brass or steel, up to 1 5-16 in. (excepting 5-32 in.). Two thicknesses of tube are available, light where the pressure is slight and extreme flexibility is required and heavy where the pressure is a greater factor.

Weidley Motors Co., Indianapolis, Ind., in order to meet the expense incident to the increased output demanded under a new contract with the Cleveland Tractor Co., of Cleveland, O., has increased its issue of preferred stock from \$200,000 to \$500,000. The contract with the Cleveland Tractor Co. extends over a period of three years and provides for an increase from \$3,000,000 to \$20,000,000. The plant is at present producing from fifteen to twenty tractor motors per day. The program contemplated will demand a production of 15,000 tractor motors the first year, 25,000 the second, and 30,000 the third. It is planned to give the plant a capacity of 100 motors daily.

There are two small rods which run the length of the chamber and which support the ends and also five semi-disks placed at equal intervals along the length of the chamber. These part-disks are of special fibre composition. The full circular side of each disk fits tight against the cylindrical casing so that air which comes in at one end must travel down and up, under and over these disk-like divisions.

Around each of these disks is wound a resistance wire to the number of five times. Slots in the fibre at its edges hold the wire in its proper place and prevent it from coming into contact with the covering. The wiring runs from two terminals placed in the head plate. Flexible wires are attached to these terminal posts and then to the battery and dash switch so that the heater can be controlled from the driver's seat.

The inconvenience, waste and annoyance of most winter starting is said to be greatly lessened by this attachment. The engine starts quicker, runs smoother and burns a leaner mixture. Carbon deposits are lessened and excessive wear and tear on the starter and battery are prevented.

The price of the "Comoncense" heater including wire, terminals, dash switch, etc., is \$10. It is being produced by Chas. H. Belknap, 46-48 Fulton Street, Brooklyn, N. Y.

Sioux City Tire & Mfg. Co., Sioux City, Ia., announces a capital increase from \$220,000 to \$1,100,000, and will enlarge the capacity of its plant from 60 to 500 tires daily.

Firestone

GIANT Truck Tires

BIG transportation problems have furnished the necessity that was the "mother of the invention" of Firestone Giant Truck Tires. First in the field. Three years ahead of all other truck tires. Bigger in superb rubber bulk; greater in both road-holding and traction ability; a more massive, resilient cushion to the load; big saving in fuel; the sum total of all that insures Most Miles per Dollar.

There are many other Firestone types, each as efficient in its class. Call in the Firestone man.

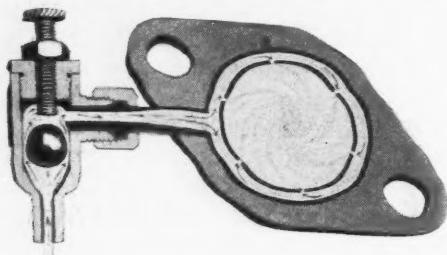
FIRESTONE TIRE AND RUBBER COMPANY, AKRON, OHIO
Branches and Dealers Everywhere



CMC Fuel-Saving Device

The CMC device is a new accessory applicable to all cars and designed to make the engine more nearly efficient, produce more complete carburetion and remove carbon. The accompanying illustration clearly shows the construction of the device. It consists of an upright ball valve which is adjustable and attached to a gasket to be inserted at the carburetor flange. This gasket is of special construction, has an air passage around it and diagonal slots in the air passage at several points of the inner circumference. Suction from the engine draws in auxiliary air through the ball valve to the gasket and enters the manifold through the diagonal slots, thus causing the passing mixture to whirl and produce a mixture well broken up and prepared more thoroughly for combustion.

The carbon removing feature of this device consists of a rubber tube of which one end is attached to the CMC device and the other dropped into 2 qts. of water



Cutaway View of CMC Device

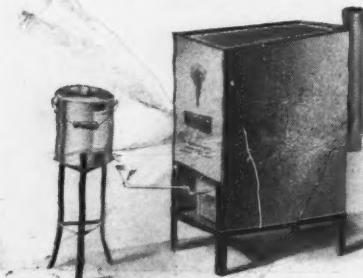
or 1 pt. of kerosene. This will be drawn into the engine through the valve and gasket, and is stated to be a quick and effective way of cleaning the cylinders. The end which is put into the liquid is equipped with a special nozzle.

This device is made by the Carburetor Mantle Co., Inc., of 1476 Broadway, New York City. It is offered for Fords at \$5; up to and including the 2-in. manifold, S. A. E., single jet, \$7.50; for larger size manifold, S. A. E., single jet, \$10.00; for double jets, \$10.00.

Scientific Garage Oil Heater

An oil burning garage heater that will undoubtedly appeal to automobile owners has just been brought out by the Scientific Heater Co., of Cleveland, Ohio, makers of the well known Scientific Gas Heater.

This new heater burns either fuel oil or kerosene and embodies a new principle in oil burning. The burner itself is wickless and sootless, and, no matter how strong the flow of fuel, will give perfect combustion.



The Scientific Garage Oil Heater

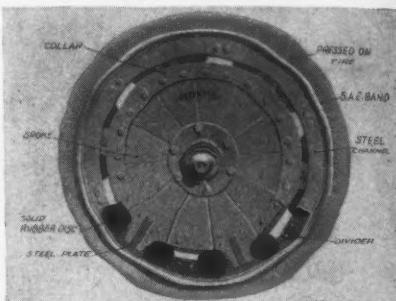
This new Scientific Heater is in no sense a stove, and embodies none of the characteristics of the usual oil stove. It is so constructed that all heat escapes from the top, and none is radiated from the sides, thus making it practical for use in garages where there is little space between car and wall.

The Scientific Oil Heater is built on the principle of the miner's safety lamp, by which all air for combustion is taken through a fine gauze and through which flame will not pass. Gasoline can be poured over and all around the heater without the slightest danger of fire.

The makers state that this new oil heater is extremely economical—only requiring a little oil a day to heat an ordinary size garage. They also claim that a garage heater quickly pays for itself in the saving of damage to an automobile caused by cold weather. Starting troubles, danger of radiator or battery freezing, damage to body finish and upholstery are entirely eliminated.

Sendelbach Resilient Wheel for Trucks Introduced

A truck wheel that has had severe tests in all climates under adverse conditions and has been found practical, is being manufactured by the Rech-Marbaker Co., 8th and Girard Ave., Philadelphia. This wheel possesses resiliency to a marked degree, this being produced by the 12 pairs of rubber discs of specially compounded rubber located near the circumference of the wheel. As shown in another illustration, these discs are compressed and re-



Sendelbach Resilient Wheel Complete

leased again as each in turn carries the weight of the car and pay-load, great resiliency resulting from this feature.

On the rear wheels this resiliency absorbs both starting and stopping shocks by moving either forward or backward. The ends of all spokes extend partly into the channel rim which holds the wheel in perfect vertical alignment even when the truck skids or pulls out of ruts or car tracks. The spoke ends are protected from chafing between the sides of the channel rim by steel plates for this purpose.

When this wheel strikes ruts, cobbles, or other rough roadway much of the impact is immediately absorbed by these rubber



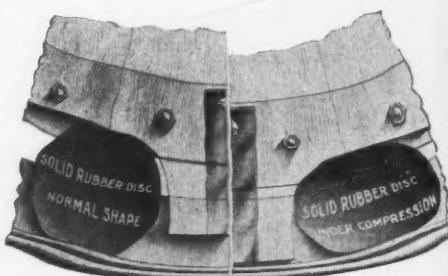
The "Sure Start" Intake Heater with Bolt and Clamps

close to the carburetor and is held by the crossbolt and lugs. It is controlled by a switch on the dash. It heats rapidly and is economical, durable, and guaranteed by the maker. The price is \$3.50 each and is made in all voltages, thus being applicable to all cars.

Commercial Auto Body & Mfg. Co., Cleveland, O., has increased its capital from \$30,000 to \$150,000.

Staybestos Mfg. Co., Philadelphia, Pa., has opened an office in the Kerr Bldg., Detroit, Mich., under the management of W. C. McComb, Jr., and another at 609 S. Dearborn St., Chicago, with Edwin E. Coith as manager.

Bijur Motor Lighting Co., Hoboken, N. J., has been placed in the hands of receivers. Liabilities are estimated at \$1,250,000, and assets at more than \$2,000,000. Lack of ready cash to carry out certain government orders is assigned as the cause of the action. E. Bright Wilson, Joseph Bijur and Louis V. Hubbard have been appointed receivers.



Wheel Section With and Without Load

discs, which co-operate with the pressed-on tires in absorbing the shocks. This co-operation makes far greater mileage from the tires possible, and as well takes care of many shocks which would be passed on to the axle and other parts of the truck. This results in a great saving in the cost of car operation and especially in the tire upkeep item.

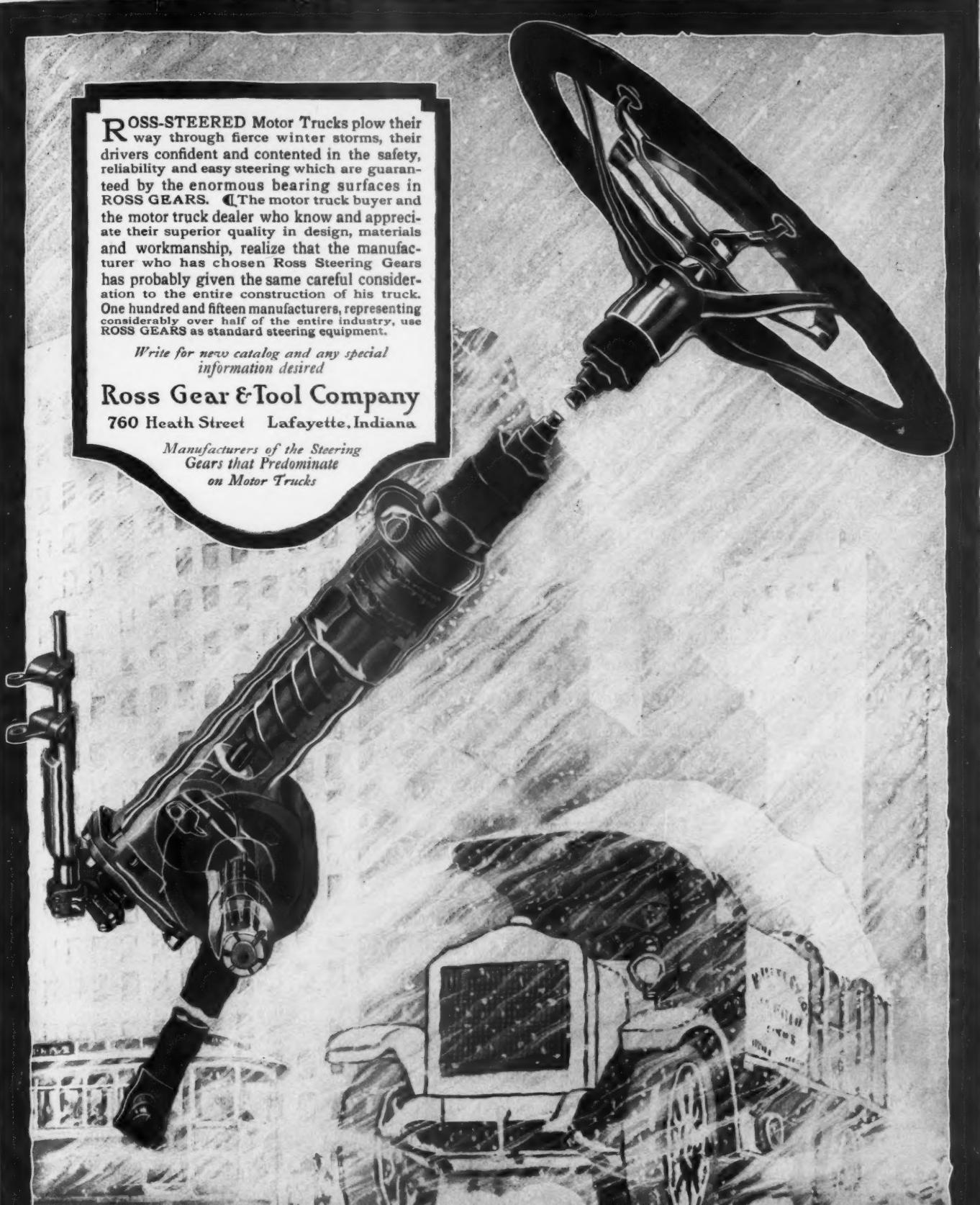
The inventor of this wheel is Edward C. Sendelbach, formerly president of the Sendelbach Wheel Co., of St. Louis. He is well known in the automobile trade and has long been considered an authority in wheel construction and on the materials entering into the construction of them.

ROSS-STEERED Motor Trucks plow their way through fierce winter storms, their drivers confident and contented in the safety, reliability and easy steering which are guaranteed by the enormous bearing surfaces in **ROSS GEARS**. The motor truck buyer and the motor truck dealer who know and appreciate their superior quality in design, materials and workmanship, realize that the manufacturer who has chosen Ross Steering Gears has probably given the same careful consideration to the entire construction of his truck. One hundred and fifteen manufacturers, representing considerably over half of the entire industry, use **ROSS GEARS** as standard steering equipment.

Write for new catalog and any special information desired

Ross Gear & Tool Company
760 Heath Street Lafayette, Indiana

Manufacturers of the Steering Gears that Predominate on Motor Trucks



Ross Gears



Dart Will Produce Three Models

THE Dart Motor Truck Co., Waterloo, Iowa, will produce for the following year 3 models rated by the makers in capacities of 2000, 4000 and 7000 lb., all following the same general lines. Each model varies only in such respects as suited for the different capacities. Engineer Mr. W. Johnson is a member of the Government Advisory Board and the 2-ton model especially shows some of the requirements to conform with government specifications.

All three models have Buda engines, dry plate clutches, Timken final worm drive, chrome vanadium springs and Hotchkiss drive.

For the purpose of detailed description Model "CC-4" is selected as representative of the line. The rated capacity of the "CC-4" is 4000 lb., body allowance 1200 lb., making a total weight on the chassis, including body and pay load, of 5200 lb. The engine has four cylinders cast in-block. The oiling system is of the

ton model the core is so constructed that it is divided into seven separate sections, each having its one opening in the top and bottom tank and each section is held in place by bolts cast integral with the tank and plugs, holding sections rigidly in place, but allowing the removal of a section in case of injury. The water cir-

the rear springs. These springs are chrome vanadium steel and have three point suspension at the driving end, so that, in case of an accident causing breakage of top leaf, the spring is supported by the second leaf and the truck can be operated without danger until the repairs are made. Both sets of springs are semi-

The Dart One-Ton, Model E, Fitted With an Oil Tank
Axles are Timken-Detroit, equipped with Timken taper roller bearings. The price is \$1850.



Dart Model L, Three and a Half Ton Truck

Has Buda engine, dry-plate clutch, Timken final worm drive, chrome-vanadium springs and Hotchkiss drive. This truck is offered in several wheelbase lengths.



positive pressure type. Oil is forced through a pipe to the main bearings and from these through passages in the crank-shaft to the connecting-rod bearings. Pistons, cylinders and cams are lubricated by oil thrown from the lower end of the connecting-rod.

Axles are all Timken Detroit and are all equipped with Timken taper roller bearings. The front axles of both the larger sizes have roller bearings in the steering knuckle.

Breaks are duplex internal expanding of extra large size. Radiators are of cast tank type, the top and bottom tanks being tinned to assist in cooling. On the 3 1/2-

culation in the two larger models is by centrifugal pumps. In the 1-ton model the thermo-syphon system is used.

Master carburetors are used on all models and are fed from tanks under the seats, by gravity, except in the 1-ton, where the Stewart vacuum system is used.

High tension magnetos are supplied on all models and electric starter and lighting systems are optional at an extra cost. All models employ dry plate clutches. In the 1-ton and 2-ton models, the transmission is mounted in unit with the engine, while in the 3 1/2-ton model it is mounted amidship. Both torque and propulsion are taken by the Hotchkiss plan through

elliptic chrome vanadium steel, heavily shackled at the rear end. The frames are of pressed steel, heat treated on the 1- and 2-ton models and of ship channel steel on the 3 1/2-ton model. Left hand steer and center control are employed on all models, the steering gear being of the worm and nut, non-adjustable, irreversible type.

Wheels are all wood artillery type. Steel wheels are optional at slightly extra cost on 2- and 3 1/2-ton models. The 3 1/2-ton model is offered in several wheelbase lengths.

Equipment furnished includes side and tail lamps, complete set of tools, and jack.

Prices are: Model "E," 1-ton, \$1850; Model "CC-4," 2-ton, \$2470; Model "L," 3 1/2-ton, \$3400.

NORTHWAY MOTORS CORP. OF MASS., Boston, Mass., has been incorporated for \$5,000,000, and will manufacture passenger cars and trucks. State Senator James E. Cavanagh is president of the company, and James E. Finneran, of the Woodward Drug Co., is treasurer. These officers, with James H. Walker, of the Walker-Wells Co., body-builders; Thos. F. Carroll, of the Gorton-Pew Fisheries Co., and James Ingraham, a manufacturer, comprise the board of directors.



Winning the Battles of Commerce

CONSTANTLY winning battles with roads and loads makes the Velie Truck supreme in the commercial field, as well as an accepted truck for military use. Equal to every emergency—capable of instant action—Velie Biltwel Trucks have particularly demonstrated their fitness for wartime service. They will solve your problem as they have others.

Simplicity of design and the use of standard specifications make repairs easy, a vital point now, when mechanically skilled labor is so hard to get.

Many years of the hardest kind of service, in every line of transportation, have shown the stuff Velie Trucks are made of—the enormous service of which they are capable.

Two sizes: 1½-2 ton, 3½-4 ton. Both worm gear drive; heavy duty Continental motors; four-speed transmission; extra heavy, heat-treated, pressed-steel frame; unusually heavy springs; large wheels and powerful brakes. Driver's seat and cab included with chassis. Gas headlights and Prest-O-Lite tank besides the regular lighting equipment.

Write today for booklets and complete particulars.

VELIE MOTORS CORPORATION, 119 Velie Place, Moline, Illinois

Builders of Automobiles, Motor Trucks and Tractors

Velie WORM GEAR DRIVE TRUCKS

When Writing, Please Say—"Saw Your Ad. in the CCJ"

New Titan Truck Composed of Standard Units

THE Titan Truck Co., 25th & St. Paul Ave., Milwaukee, Wis., has produced a five to six-ton truck built for contractors and heavy hauling service. The men back of the Titan Truck Co. have been identified with both the heavy duty truck industry

carrying axle of nickel steel forging with spindles integral. This axle has a road clearance of 16 in. and is fitted with radius rods that take the drive. Both brakes are of internal expanding type on rear wheels and have drums 29½ in. diameter. Tires measure 36 x 6 in. front and are solid, and



This Titan Truck Has a 4½ x 6 in. Buda Engine. Its Maximum Capacity is 12,000 lb.

and the contracting field for some time. They believe that a better heavy duty truck than any so far produced is not only possible but is necessary for this class of work. Coupling their experience of the outstanding facts of truck performance under adverse conditions, with their general knowledge of trucks, they have turned out a product that is claimed to be of very rugged, powerful and lasting construction. The normal load capacity is 10,000 and the maximum, 12,000 lb.

A four-cylinder L-head Buda 4½ x 6-in. engine is used and mounted on a three-point trunnion suspension and is limited by a Simplex governor to 1000 r.p.m. Lubrication is by force feed throughout from an oil reservoir of 16-qt. capacity. Cooling is by a radiator of the cellular type, cushioned by springs and trunnion mounting on the frame. The carburetor is of the latest model Stromberg type with hot-air stove. Ignition and lighting are by Bosch high tension magneto. The clutch is of the dry disc type, 12 in. diameter, enclosed in a separate housing in unit with the engine. Transmission is of the constant mesh, Cotta type, and is located amidship and is also on a three-point trunnion support as is the engine. The frame is of special alloy, pressed steel channel, 8 in. high and of ¼-in. stock with 3-in. flanges. All brackets and fastenings are made by extra large bolts and heavy lock washers.

Springs are semi-elliptic type, both front and rear, measuring 48 x 3 in. front and 60 x 3½ in. rear. Front axles are drop-forged I-beam section. Knuckles are of the Elliott type, fitted with Timken roller bearings. The rear axle is of the internal gear type of 5-6 ton capacity and of the Titan-Clark make, supplemented by a load-

is of the three-quarter floating type, while in this truck offering the rear axle is one-half floating. Tires measure 31 x 4 in. front and 32 x 4 in. rear. The covered express body that is fitted to the chassis in the accompanying illustration measures 114½ in. from the inside of the tail board to the inside of the head board. The width is 45 in. and height is 63 in.

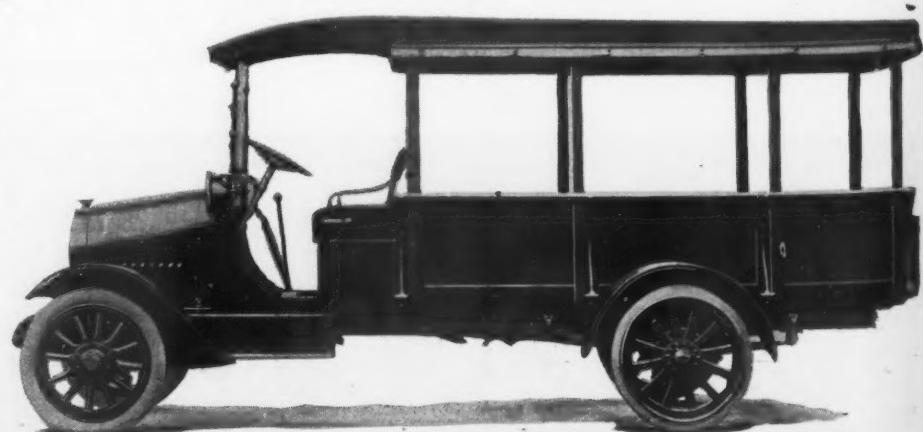
The top is supported on each side by four 1½ by 2 in. stanchions and is removable by releasing it from the sill cross members that are attached to stanchions. The body is equipped with a headboard substantially fastened in place, as well as a tailboard supported by three sets of hinges. The windshield is mounted on the cowl in a substantial manner and is supported by brackets of sufficient size to hold it firmly. It is of the usual design, double ventilating type, both upper and lower sections being adjustable. The cowl is of heavy sheet steel, riveted to the angle iron frame. The instrument board carries speedometer, carburetor choke, ammeter, oil pressure gage, lighting and ignition switch, all being conveniently and neatly arranged and mounted flush with the board. The seat is wide enough to accommodate three people and an upholstered lazy-back extends the full length of the seat.

A sheet steel hood covers the engine and is held in place with three hinge rods. A heavy anti-squeak is used under both ends of the hood to prevent rattling. Crown fenders are of heavy one-piece pressed steel and are attached to frame side members by V-sectioned irons. Springs are of high-carbon steel, semi-elliptic, both front and rear. The front springs measure 38 x 2¼ in. and have eight leaves, while the rear measure 54 x 2½ in. and have twelve leaves.

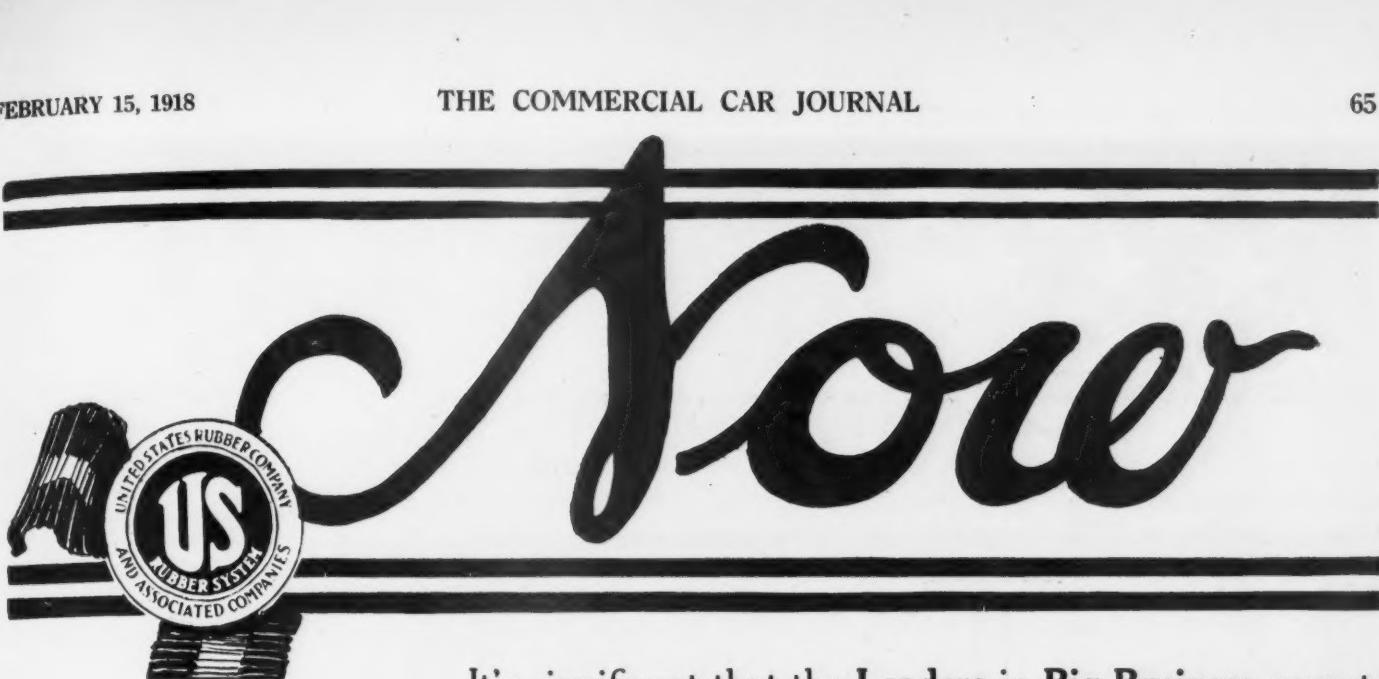
Chevrolet Worm-Drive Truck

The Chevrolet Motors Co., New York City, have entered a new field, the production of motor trucks, and have announced a one-ton worm-drive product. The chassis used is a modification of the same one as employed in the passenger car Model FA. The weight of the chassis is 3560 lb. and the price is \$1125. The power plant is practically the same, the only difference being that it is fitted with a Monarch governor. In the passenger car chassis the rear axle

Champion Ignition Co., Flint, Mich., has developed a new speedometer known as the A. C. Baldwin. It has been tested very thoroughly, and has been under development for more than 2 years. It is of the magnetic type. Russell Baldwin, who was connected with the Stewart Speedometer Corporation for a number of years, developed the instrument. Manufacture of the new product will not be begun for some time. It is planned to add new buildings to the Champion Ignition Company's factory group for its manufacture.



New One-Ton Worm-Drive Truck Offered by Chevrolet Motors at \$1125



The big packing house whose "spoilage" problem requires rapid, all-the-time delivery facilities chooses United States Tires.

The great mail order house, with its strenuous transportation problems places dependence on United States Tires.

The publishing house, whose weekly task it is to flood the country with magazines, desires nothing better than United States Tires to rely upon.

The great railroad whose ability to keep everything moving is its prime asset finds United States Tires for its heavy trucks the "one best bet."

It's significant that the Leaders in Big Business operating heavy trucks use United States Tires. Significant because it isn't a thing that just happens to be that way.

Men—students of values—experts in buying methods have found these desirable things in U. S. Tires:

Light Weight Without Impaired Volume or Durability

The tire is at the circumference of the wheel where the inertia or "flywheel" effect of a heavy weight is most pronounced. Wheels equipped with heavy tires skid more easily, consume more engine power in attaining speed, and present more friction in reducing speed.

Resiliency—Our use of highest grade rubber and our secret process treatments result in wonderful resiliency.

Toughness—Our exertion of 1,600,000 pounds pressure in vulcanizing United States Tires secures highest non-porosity and extreme durability.

Service—We are represented in every large city. Quick, efficient, Tire Changes mean much to the truck owner.

UNITED STATES TIRE COMPANY

1790 Broadway

NEW YORK

The Brewery with the nationally-consumed product equips its heavy duty trucks with United States Tires and delivers on time.

The Express Company seeking quality supremacy in solid tires for its trucks relies on United States Tires and is not disappointed.

The great Oil Company, upon whose transportation facilities a throng of other businesses depend, places United States Tires on its wheels.

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TRUCK
TYRES

**MADE IN
NEW
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POLACK TYRE & RUBBER CO.

10,000 MILES GUARANTEE INvariably EXCEEDED

A greater amount of rubber, more scientific preparation, a more practical tread, a longer, richer experience in tyre making enable us to guarantee that Polack E. S. type Tyres will give 43% more service than is customarily guaranteed.

The higher first cost becomes a negligible quantity compared with the additional mileage obtained.

POLACK TYRE & RUBBER CO.

Broadway & 62nd St. New York

Branches and Service Stations in Principal Cities

A Power Windlass Now Furnished on Duplex Trucks

The Duplex Truck Co., Lansing, Mich., has announced that they will furnish as equipment on the Duplex four-wheel drive truck an additional sales help in the form of a powerful winch. There are many businesses in which the hauling problem requires the use of a winch and this innovation should be of more than passing interest to concerns employing such devices.

Description of the Winch

The Duplex winch, which is known as type CS, is self-contained, of the single

a guard. The worm wheel is of bronze meshing, with a steel worm and is enclosed in an oil-tight case, providing continuous oil bath. The drum is operated by cone friction of ample diameter to handle a maximum load of 10,000 lb. at a 4-in. radius. The rope speed is approximately 50 ft. per minute when the engine speed is 1000 r.p.m.

A hand operating lever controlling the friction is carried forward to the driver's seat, giving him control of his engine and the winch from the same position. The friction end of the drum is provided with an external contracting brake band, permitting the full load to be easily lowered by means of a foot brake lever.



The Duplex Four-Wheel Drive Truck Fitted With Its New Equipment, a Power Windlass.

drum type, and mounted on a structural steel base so that it is ready for direct assembly on the truck frame. Height from the bottom of the winch base to the hoisting point is 18½ in. The drum barrel is of steel, giving much better wearing qualities than the usual cast iron. It is 7½ in. diameter, 21 in. long and with flanges at each end 17 in. diameter. Main shaft drum bearings are spherical and prevent brackets from breakage due to twisting action. Brass bushings are used throughout.

The winch is mounted under the driver's seat and all parts are easily accessible. It is operated from the transmission by a worm and worm wheel and connecting the worm wheel shaft and drum shaft is the Whitney roller chain, neatly covered with

The special disk clutch enables a nigger-head to be applied to both ends of the drum shaft as desired and this may be operated independently of the drum if desired. This permits one load to be held on the drum and the niggerhead used to handle another.

The Gersix Heavy-Duty Truck

The Gersix Mfg. Co., Seattle, Wash., put on the market about two years ago, a powerful truck built to meet the demands for a truck that could stand up under extremely difficult road and hauling conditions such as are found in the Pacific Northwest. The offering made at that time has been refined materially and the present truck contains a six cylinder engine so as to avoid the changing of gears that oftentimes is necessary on rough roads. The Gersix is built especially for heavy-duty hauling, as may be noted by the 6-in. channel steel frame and the general heavy construction of the truck throughout. The power plant is equipped with such standard units as Bosch high tension magneto, Stromberg carburetor and Westinghouse electric starting and lighting system. The capacity of this



The Gersix Heavy-Duty, Six-Cylinder Truck Has Buda Engine and Magneto Ignition



Free Package Delivery Service Between New York and Camp Upton, Yaphank, L. I.

Harry J. De Bear, manager of the New York branch of the Maxwell Motor Sales Corporation, has discovered a solution of the difficulty experienced by officers and enlisted men at Camp Upton, in receiving packages from friends and relatives in New York, and in disposing of their personal belongings. He is conducting a free package delivery service, running a Maxwell one-ton truck two or three times a week between the two points.

truck is 2½-tons and complete with starter and electric light, the price is \$2850 f.o.b.

The engine is a Buda, 6 cylinder, 3½ x 5¼ in. L-head type. Lubrication is a combination of force-feed splash and the carburetor is a Stromberg. The engine is fitted with a Monarch governor. Ignition is by Bosch high tension magneto and the starting motor is of the Westinghouse, Bendix drive type, while the battery is a Willard. The radiator is an Ideal cellular, while a Borg and Beck disk clutch is used. Transmission is a Cotta mounted in unit with the engine, having three speeds forward and one reverse. The rear axle is of the worm gear drive, full floating type and the gear ratio is 9 2-3 to 1. The front axle is a Liggett L-beam. Springs are semi-elliptic of special alloy steel, front measuring 2½ x 42 in., while the rear are 3 x 56 in. The frame is braced by heavy gusset plates and cross members, riveted to it. Wheels are 36 in. wood, while tires are 36 x 4 in. front and 36 x 7 in. rear.



FEDERAL
Has Standardized on
Smith Wheels
"EVERLASTING"
FOR 3½ TON AND 5 TON MODELS

Smith Wheels Guaranteed **FOR LIFE OF TRUCK** on which originally placed

Smith Wheels save their cost in Tire and Gasoline Mileage in the first few months they are run.
They make your Truck last longer.

SMITH WHEEL^{INC}
SYRACUSE, N.Y., U.S.A.

The steering device is of the Ross irreversible type, fitted with an 18-in. wheel. The wheelbase is 150 in. while the tread is 60 in. both front and rear. Equipment includes electric side and tail lights, horn, oil can, jack, tool kit and Stewart vacuum system feed to the carburetor.

Tri Ton, A Semi-Trailer Equipped With Brakes

THE Tri-Ton Corp., 250 W. 54th St., New York City, has on the market a high-speed semi-trailer equipped with brakes that are operated from the truck tractor, and especially adapted to any particular line of business. The Tri-Ton semi-trailer is sold in chassis form on which can be mounted any of the numerous styles of bodies, such as are used on ordinary motor trucks.

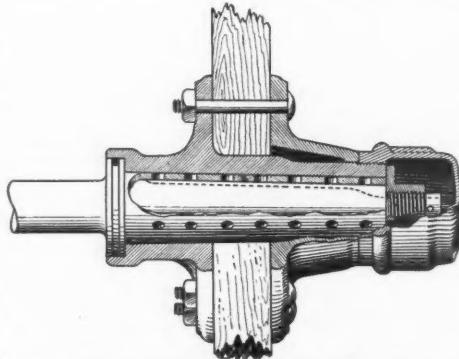
This semi-trailer system lends itself to the efficient handling of bulky loads, as the loading area can be extended or proportioned to carry the maximum weight of the semi-trailer's total rated capacity. Fitted to a one-ton truck, this semi-trailer sells for \$2000. Brakes and connections are not affected by the rocking and irregular shifting actions between the truck and semi-trailer by the introduction of a special universal joint, placed in the center of the fifth wheel. An interesting detail of construction permits the semi-trailer to be detached from the truck or tractor, without interfering with the brake mechanism. Brakes are fitted with a conveniently located device for locking the wheels of the semi-trailer when it is detached, thus permitting loading and unloading on steep hills. When the position of the motor truck brake lever permits, the semi-trailer brake mechanism may be connected to it, thus allowing the brakes of the truck to operate the braking of the semi-trailer, otherwise a separate brake lever is used. The fifth wheel assures instantaneous attaching and detaching, there being no bolts to remove and only a few moments' time is required to shift a small lever and the semi-trailer and truck are separated. Front end lifting supports, that are attached to the semi-trailer, are furnished at a reasonable extra

charge. These supports lift and sustain the front end of the semi-trailer when detached and are recommended where there is repeated interchanging of vehicles.

The frame is of channel steel and is fitted with channel cross members heavily reinforced with gusset plates. Frames of any dimension can be had on special order. The axle of the Tri-Ton is of single drop forged steel. Springs are semi-elliptical and have bushed ends. Bearings are of the taper roller type, designed for high speed, and there are two in each wheel, which are of the artillery type and made of second growth hickory. Tires are solid rubber, although cushion or pneumatic may be had by special order. Tri-Ton trailers are built in several models from $1\frac{1}{2}$ to 18 tons capacity and may be used with motor trucks from $\frac{3}{4}$ to 6 tons capacity.

Martin Axle for Semi-Trailers

The Martin floating bearing axle is designed especially for use on tractor semi-trailers. The experience which the Martin Rocking Fifth Wheel Co., of Springfield, Mass., has had with trailer axles, has been



The Wohlrb Steering Gear and Its Parts

responsible for their bringing out this axle which, although not a new idea, has been used with great success in Europe for many years. This axle, as its name implies, has a bushing which floats between the shaft and the hub.

The special features of the Martin floating bearing axle are the means of lubrica-

tion and the means of retaining the lubricant. There are grease reservoirs consisting of holes bored in the floating bearing in a spiral so that at every revolution both the hub and spindle are oiled. There is a felt washer which prevents grease from getting out at one end, and as the hub cap fits directly against the hub flange, it prevents the grease from getting out at the other end.

The thrust is taken entirely by the hub and not by the floating bushing. It requires no adjustments, it being necessary only to pack it with grease, put on the wheel, screw up the axle nut and screw on the hub cap.

The axle is made in $1\frac{3}{4}$, 2, $2\frac{1}{2}$ and 3-in. sizes, ranging from 56 to 60 inch gage. Prices are \$60, \$75, \$120 and \$150.

Foss-Hughes Door Opener

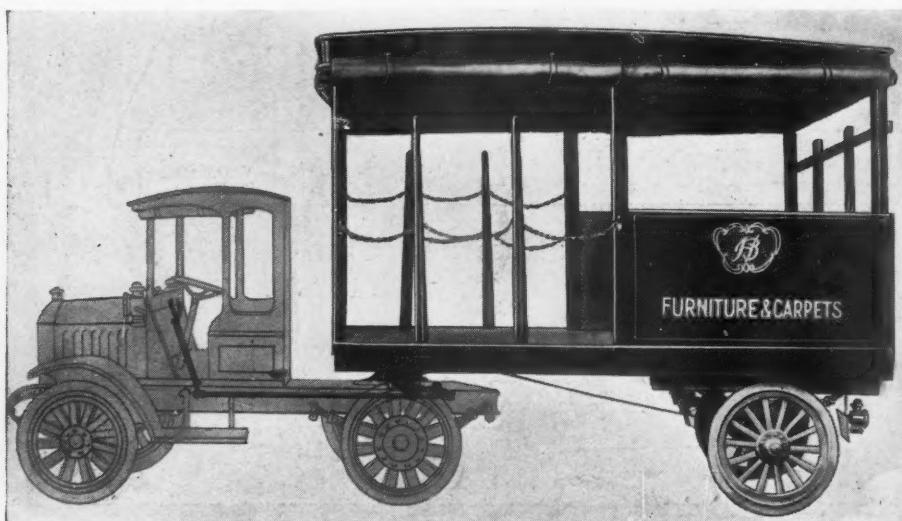
The Foss-Hughes pneumatic control for garage doors is a device for operating any type or size of swinging, folding, or rolling door. It is manufactured by the Foss-Hughes Co., 21st and Market Sts., Philadelphia.

Through a control box with a double three-way valve, which may be located in any part of the building, compressed air is released and injected into opposite ends of a double cylinder, which opens or closes the doors by means of cables. The main control may be augmented by as many other controls as desired, so the doors may be operated from any part of the building. The entire mechanism of control box, pistons and cables being of very simple yet practical design, it is almost impossible for any of the arrangement to get out of order. The first installation has proven itself in constant operation for the past seven years with practically no attention or expense, and has since been simplified and improved in many ways.

The simplicity and adaptability of the device insures its easy installation in either a new building or an old one. It does not require the services of a skilled mechanic to couple it up; any man who will follow the instructions furnished can quickly complete the work and without difficulty.

Of the many advantages for mechanically operated doors, particular attention is called to the conservation of heat through the quick opening and closing of these doors, thereby preventing drafts and permitting the building to be kept uniformly heated.

Jones Motor Car Co., Wichita, Kans., manufacturer of Jones passenger cars and trucks, has let a local sales contract for the distribution of its products to the Shaw-Snyder Motor Car Co., and with the auctioning off of a \$60,000 stock of automobile tires and accessories, has passed entirely out of the retail business. The stock of accessories auctioned off was the property of the Jones Auto Exchange—a subsidiary organization of the Jones Motor Car Co. The general purchasing offices in charge of O. H. Ressegue, formerly located at Detroit, have been consolidated with the local branch, and all offices of the company are now in the executive building at the Jones factory.



Drawing Showing the General Appearance of a Tri Ton Body Fitted to a Tractor Truck. The Big Feature of This Trailer is the Braking System

The PAIGE and the



That is the way their present line of vehicles will be described, if you ask the Schall-Crouch Auto Co., the greatest dealers in the city of Baltimore. For they have just adopted the Atterbury in addition to the regular line of "Paige Cars."

Other big pleasure-car dealers have done the same.

And their investigations convince them that the adoption of the Atter-

bury will add to the prestige of whatever line of world-known cars they happen to deem best.

Write now to:

ATTERBURY MOTOR CAR CO.
Elmwood and Hertel Avenues
Buffalo, N. Y.



When Writing, Please Say—"Saw Your Ad. in the CCJ"

Torbensen Offers Front Axles

To accompany its line of rear axles for commercial cars, the Torbensen Axle Co., of 1115 E. 152nd St., Cleveland, has recently started production of a complete line of front axles of from $\frac{3}{4}$ to $2\frac{1}{2}$ -ton capacity. This new product of this well-known concern is offered in three capacities, the lightest being the Type OO-2, capacity $\frac{1}{2}\text{-}\frac{3}{4}$ tons and the heaviest being Type CC-2, capacity $2\frac{1}{2}$ tons. Type AA is the medium weight axle with a capacity of $1\frac{1}{2}$ tons. These axles are made for standard tread and have taper roller bearings in the wheel hubs. The models vary in the dimensions of the various parts only, being similar in construction.

Type AA Medium Weight Axle

The capacity of the Type AA is 2200 lb. (truck and load) on the spring pads. This model has Bock taper roller bearings in the wheel hubs, the other two having Timken bearings of the same type. The axle itself is $2 \times 2\frac{3}{4}$ in., has 29-in. spring center pad hole. Spindles are of chrome nickel steel and are $1\frac{3}{4}$ in. at the large end, tapering to $1\frac{3}{16}$ in. at the outer end. Steering arms are also of chrome nickel steel, so designed that the tie-rod is located at the rear of the main member. The steering ball, which has a diameter of $1\frac{1}{4}$ in., is located at the left of and above the axle. The total steering angle is 80 deg. The hub allows for fourteen spokes not over 2-in. diameter. The approximate weight of the axle with hubs is 165 lb.

Type OO-2 Axle, the Lightweight

The Type OO-2 axle has a load limit of 1800 lb. on the spring pads. The "I" beam is $1\frac{1}{8} \times 2\frac{3}{8}$ in. The weight complete with hubs is 145 lb. Spindle diameter is $1\frac{1}{2}$ in. and wheel hubs operate on Timken taper roller bearings. The diameter of the steering ball is $1\frac{1}{8}$ in. Spring centers are 29 in. and accommodate 2-in. springs. Hubs are designed for twelve $1\frac{3}{8}$ in. spokes.

The Type CC-2 axle has a load limit on spring pads of 3000 lb. The axle itself is $2\frac{1}{4} \times 3$ in. and the complete axle weighs 185 lb. The spindle is 2-in. and Timken

taper roller bearings are used in the hubs. The steering ball is $1\frac{1}{2}$ in. diameter. Springs $2\frac{1}{4}$ in. wide can be mounted. Fourteen 2-in. spokes are accommodated by each hub.

Stevenson Truck Units

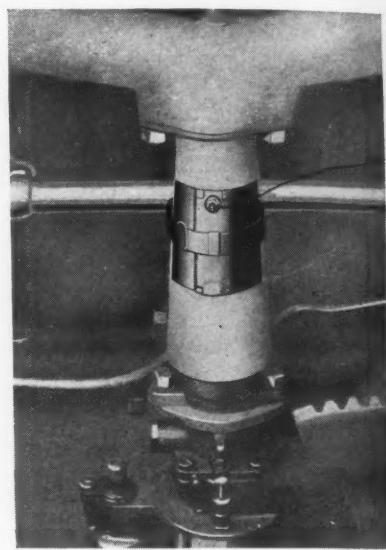
The Hedden Place Machine Co., Inc., of East Orange, N. J., is now manufacturing truck units in three capacities, these being the $\frac{3}{4}$, the 1, and the $1\frac{1}{2}$ -ton models, known as Models B, A and C, respectively.

Like the other models the C has a worm drive rear axle. The frame is furnished especially for Fords or with a special frame to fit most makes of cars having a transmission ahead of the drive shaft. The frame is of 4-in. channel iron, 167 in. overall. The axle is worm drive with a gear ratio of $7.75 : 1$. It has a heavily ribbed housing and accessibility is a feature of it. Springs have 11 leaves, are semi-elliptics, size $50 \times 2\frac{1}{2}$ in., and drive is taken through them. The drive shaft is tubular and has a Spicer universal joint. Tires, 32×4 in. solids, are standard equipment. Brakes are single or double $14 \times 2\frac{1}{2}$ in. Wheels are constructed of good hickory and have twelve 2-in. spokes. Standard wheelbase is 125 in., the 135-in. costing \$10 extra. Tread is standard and weight, attached to a Ford, totals 2100 lb. The price is \$550 f.o.b.

Model B Fifteen Hundred Pound Unit

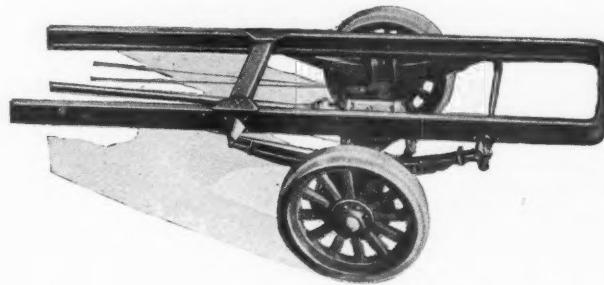
Model B varies from Model C as follows: frame 3-in., 160 in. overall; gear

An electric manifold heater operated by battery current is offered by the Electric Intake Heater Co., of 115 E. Cortland St., Jackson, Mich., the purpose of the device



The Electric Intake Heater Attached

being the heating of the intake manifold to produce a more easily combustible mixture to pass on to the cold engine, thus expediting engine starting and saving the starting battery, or lessening the labor of hand-cranking. When possible, the heater is attached to the intake manifold below the "Y" and is fitted by bending the heater



Complete Stevenson Truck Unit. Offered With From Three-Quarter to One and a Half Ton Capacities, All Models Having Worm-Drive Axles.

ratio $6.2:1$; springs $42 \times 2\frac{1}{4}$ in., tires 33×4 in., brakes $14 \times 1\frac{3}{4}$ in., wheelbase 119 in., weight attached to Ford 1650 lb., price \$440 f.o.b. East Orange, N. J.

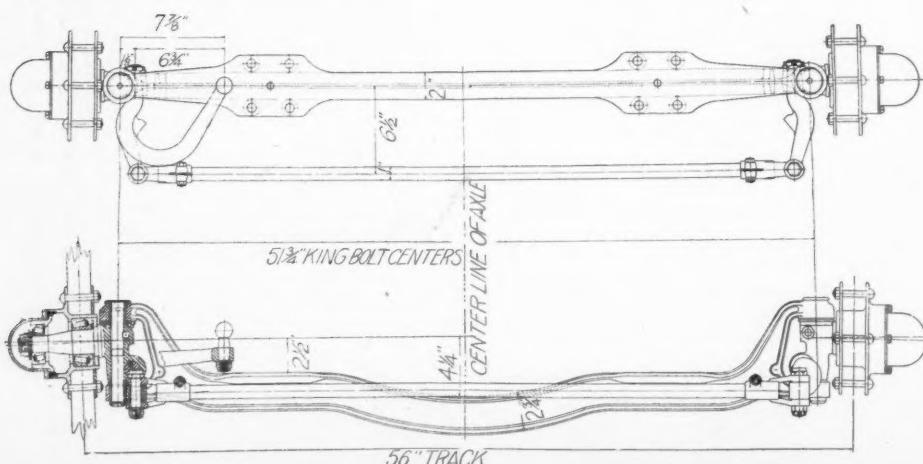
shell to a close fit, the center of it being held close to the manifold by the binding band, which is drawn tight. Control of the heater is from a dash switch.

Taft-Peirce Factory Tools

The Taft-Peirce Mfg. Co., Woonsocket, R. I., is the manufacturer of a complete line of gages and tool room specialties, magnetic chucks, Martell aligning reamers, thread millers and universal grinders. The tool room specialties include hardened and ground steel parallels, box parallels, toolmakers' knees, bench plates and universal right angle irons.

Speer Carbon Brushes

The Speer Carbon Co., of St. Marys, Pa., is making a complete line of brushes for use on starting motors and lighting generators of motor cars, these being of metal, metal-graphite, gauze, etc.



Plan and Side Drawing of the Torbensen Type AA Front Axle

BUDA ENGINE
High-Class

*Five Times Tested
- and Proved!*

The smoothness in action and remarkable durability of the BUDA ENGINE are the results of the finest manufacture. They are safeguarded by tests of each engine which, we believe, are of unequaled severity.

1st, each engine is run by outside power until smooth. 2nd, it is run by its own power until smooth. 3rd, it is taken apart, examined and carefully adjusted. 4th, it is run under its own power. 5th, when it runs with perfection, its power output is measured by the electric dynamometer.

The engines which survive all these tests are real BUDA ENGINES for trucks, farm tractors, or high duty stationary work.

Made by The BUDA COMPANY, Harvey (Chicago Suburb), Ill.

THE BUDA ENGINE
“HIGH CLASS”

Creamery Trucks Keeping the Roads Open

By FRANK FARRINGTON

IF automobile traffic is to continue through such a winter as this, it is necessary that the roads be kept open. And if the roads can be kept open for motor traffic nobody need worry about any other winter. This is the winter of the deep snow and all former accumulations of the frosty element are mere shadows of the 1917-18 production.

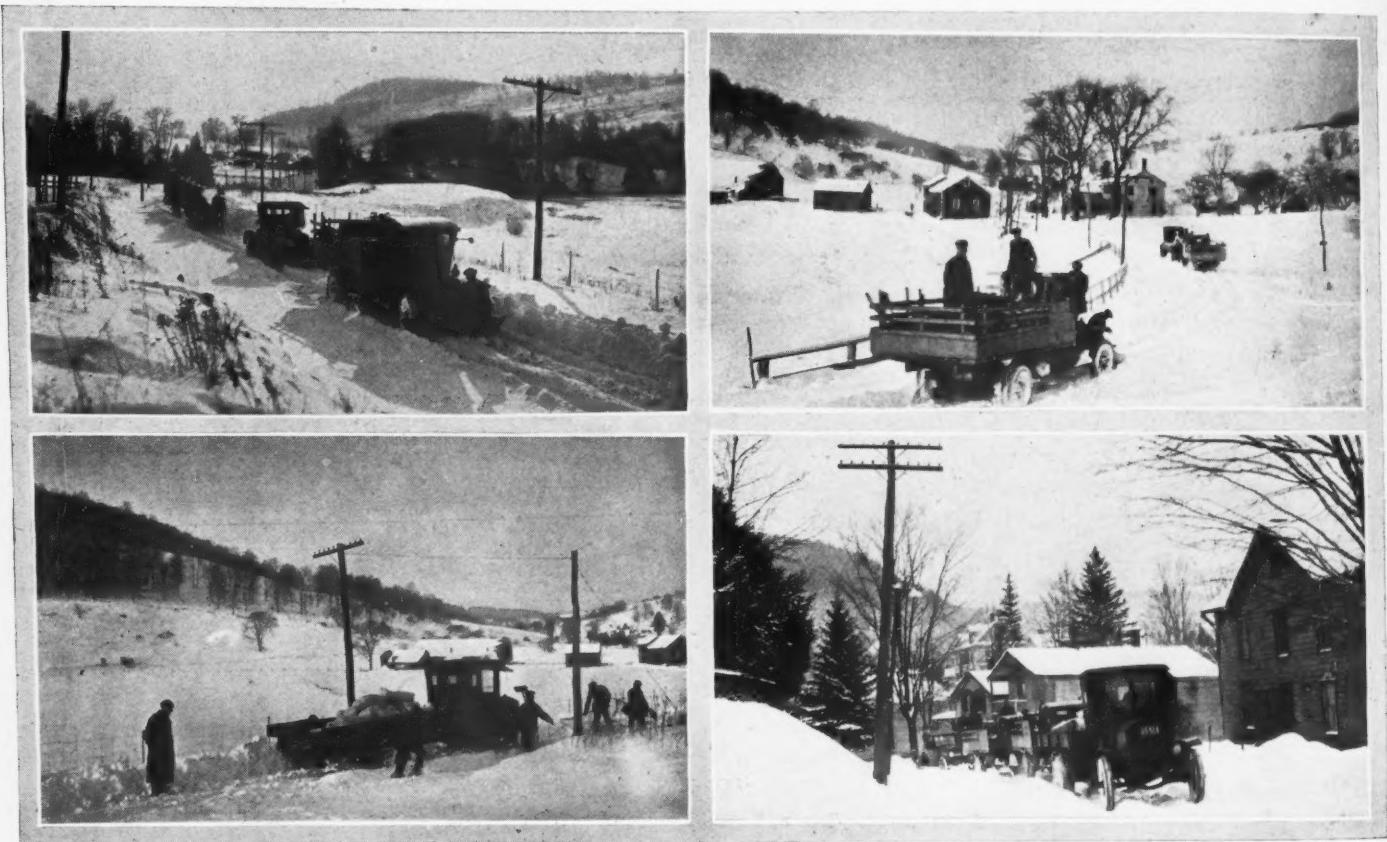
The specific incidents photographed herewith represent conditions in the western part of the Catskills where an early Glidden tour came to grief in the effort to get through rivers of mud and oceans of water on the way to Pittsburg in the days when tire chains consisted of makeshift arrangements of rope or whatever came

truck. Two of these trucks are used to bring milk and cream from the Meridale Farms creamery, owned by Messrs. Ayer and McKinney, of the well-known N. W. Ayer Advertising Agency, to the railroad. Meridale has the reputation of being snowed in and almost buried every winter. The trucks are running, making several trips a day, through deep cuts in the snow banks.

The success of their continued operation is based on starting the snow plow early while the snow is not deep enough to impede travel and keeping it from getting deep. While the snow is fresh and light the trucks can be run at sufficient speed to throw the snow well back from the

by the snow plow which will not cut the ice in the middle between the wheel tracks and this means a tractionless footing for the drive wheels as long as the snow in the ruts is dry. In the country in the snow, you know, everybody drives in the same rut. There is no driving all over the road and keeping it all packed down.

The big lesson of the whole of winter trucking experience is to keep the road clear from the start, running a truck over a route all night if necessary when a heavy snow is falling. Running the snow plow all night is better than some of the experiences of this winter, where truck drivers out in the country have shoveled all



Heavy Snow Has No Terrors For These Trucks, Which Keep the Roads Open

By "keeping everlastingly at it," these trucks were able to keep the roads open during the heaviest snowfalls that have occurred so far this winter. As soon as the snow began the trucks began, and if necessary, operated all night, back and forth, over a stretch of some eight miles, between the dairy and the shipping point. In this way this particular stretch of road has been kept open, while almost every other road in the country was closed for a period of longer or shorter duration.

handy. Needless to say that without chains winter automobile traffic in these country districts would be conspicuous by its absence.

One of the hardest pieces of state road to keep open in this snowy section of a snowy state is eight miles, reaching from the railroad up into the country with a rise of a hundred feet to the mile, the road crossing hilltop country that is swept by the winds and every loose flake of snow blown until it lodges in a hollow or roadway.

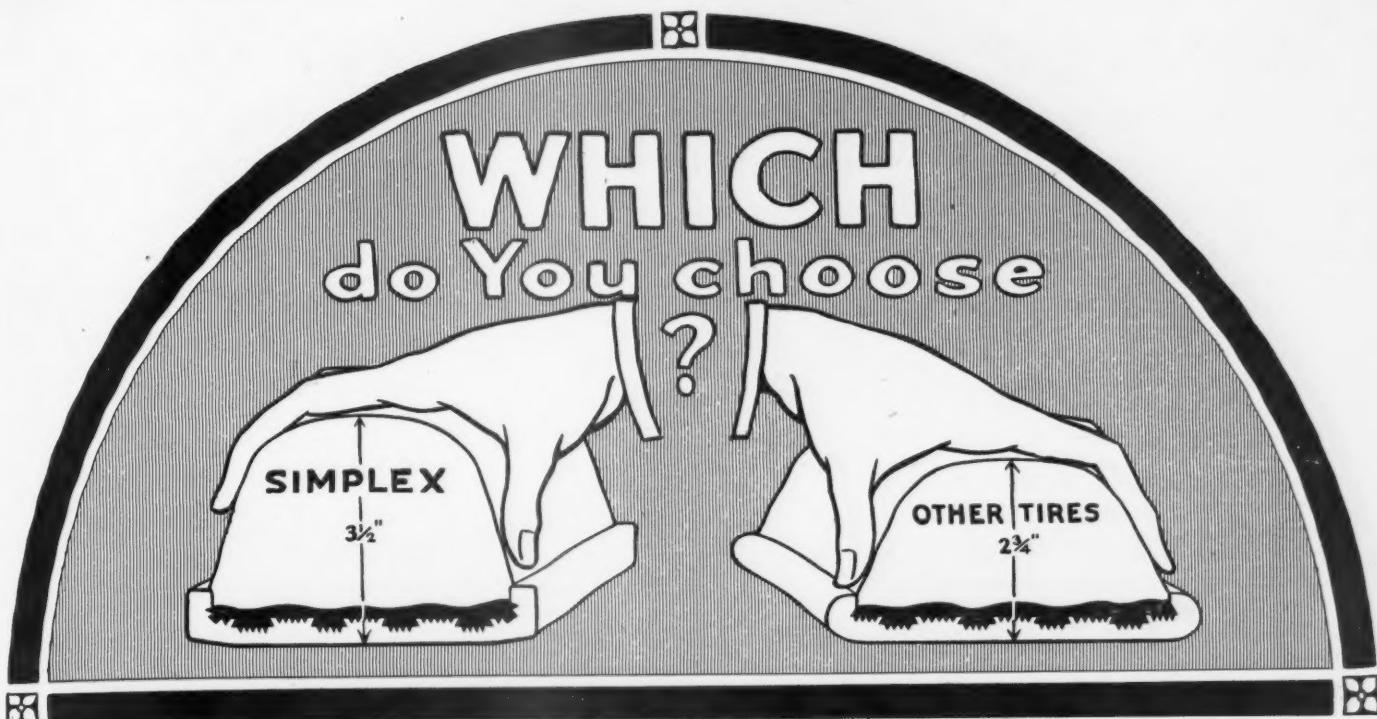
This road is being kept open by the use of a snow plow on the front of a White

track. If it is allowed to accumulate the snow plow can, at best, only wallow through and make a narrow cut which ultimately becomes too deep to throw the snow out with a plow. Then it takes a lot of shoveling to get a road through.

Another trouble that arises when the snow is allowed to accumulate a little is that a rain may make the road slushy and then the wide truck wheels make deep gutters in the slush and leave the center high. When it freezes the wheel tracks are clean cut ditches and the dry snow that blows into them cannot be touched

night in the effort to get their trucks home through the snow that has accumulated with one all-day storm.

Snowy road trucking calls for heavy loads to hold down the drive wheels so they will pull. This is where the light truck or an empty truck finds itself getting into trouble. Just the other day I found myself stalled on the ice just because of getting off from the crown of the road with no load over the drive wheels. The chained wheels spun without effect. The only way out was to gather a load of bystanders and get them on to add weight.



The Extra Rubber Protects Your Truck

Many of the largest fleet operators in the country are today using Simplex Super Size Tires as exclusive equipment.

The list includes such concerns as the Loeser Department Stores in Brooklyn, the great Clafin Stores, the Peter Doelger Brewing Company, the Steinway Piano Company, and scores of others.

We name these concerns because the fact that they use Simplex Tires offers an exceedingly safe guide for any truck owner to go by, who is seeking the greatest protection for his truck at a minimum of expense.

Such large fleet operators as this don't buy truck tires on guesswork. They have every facility for keeping records, comparing tires, and checking costs.

Many such concerns as this began using Simplex Tires three years ago, and today use them as exclusive equipment, because their records have proven that the extra

thickness of Simplex Tires means extra protection for their trucks and a great reduction in tire costs.

Simplex Tires are genuine Super Size Tires.

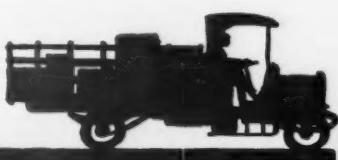
Instead of adhering to the thickness, which is practically universal among standard American truck tires, we have added a large amount of extra rubber, varying with the width of the tire. For example: a 7" Simplex tire measures $3\frac{1}{2}$ " in thickness, while the average truck tire measures only $2\frac{3}{4}$ ". This gives a full $\frac{3}{4}$ of an inch of extra cushion for your truck mechanism—an extra $\frac{3}{4}$ of an inch of rubber to wear through.

Yet Simplex Tires sell for no higher prices than are asked for the ordinary standard tires.

And, furthermore, you will find the rubber stock in Simplex tires so tough and wear-resisting that they would be unusually long-lived even though they were no larger than other tires.

Simplex Rubber Company of America, Inc.
Factory and General Offices:

Batavia, New York



New England Using the Highway Freight

Manufacturers, Chambers of Commerce, Motor Truck Dealers and Road Builders Co-operating for Better Shipping Facilities

By SAMUEL SAYWARD

NEW ENGLAND is awake to the possibilities of the profitable carrying of freight by motor trucks. The stern necessities of war have opened the eyes of the conservative Yankee. Even the wildest dreams of the motor truck salesmen in talking motor trucks to business men are being realized.

When a manufacturer can obtain supplies in an unending stream through the regular channels he is content to place orders far enough ahead to provide for the steady flow of raw materials to his doors, but when the time comes that the current is temporarily diverted and a shortage arises in his supplies, he awakens to the fact that he must send out along the line and pick out his supplies and rush them to his plant in the quickest possible manner, no matter what the cost may be. Delay spells expense. Delay, coupled with uncertainty, spells business curtailment, closing of departments and the ultimate failure of the enterprise.

Into this gap the motor truck has fitted. It turns failure into success. It opens up channels of trade heretofore undeveloped. It is going to mean the salvation of scores of business enterprises, not only in New England, but throughout the nation. The healthy individual known as the motor truck baby

shops of his neighbors. He must learn something of their ways. He must go to them prepared to tell them a whole lot about their own business needs and he will come away with a pocket full of orders.

Upon the foresight of the present day motor truck salesman depends much of the future success of the inter-city busi-

the salesman explained. "That would have ended our business dealings with him. We never would have sold him another—that is, probably never—for that man would have gone to the wall in short order. I think I have showed him his mistake. I think that when that man is really ready to buy from us, it will not be one truck, but dozens of



Trucks in Boston to Akron Express, With World's Largest Pneumatic Tires, 44 x 10 in.

ness done by trucks. Nor must it be limited to the inter-city class. It is interstate in scope—limitless in possibilities.

One of Boston's most successful motor truck salesmen reported to the head

trucks that he will order. Isn't that worth waiting for?"

The salesman continued to outline his reason for refusing to sell a truck. Strange as it may seem, he was building business for this firm. He was absolutely certain that when his prospect again went into the market for a motor truck he would come to this salesman and to this salesman's firm only.

When this customer had been given the final demonstration of the truck and had taken the salesman into his office, he drew out his check book, ready to pay cash on the spot for the truck. The salesman halted him.

"I want to ask you a few questions before you make out that check," the salesman said. "I am not asking them for curiosity. If you don't care to answer them, just say so and I'll stop."

He learned from the customer that he had received two short term contracts for hauling freight with the prospect that if the thing worked successfully, the contracts would be renewed. He learned that the customer expected to pick up more business after the truck was in operation. He learned that the contracts which the customer held would pay only a part of the actual cost of operation of the truck, that the customer did not have unlimited financial backing to carry him over the rough spots or through emergencies. In short, he



Plowing Through New England Snows on Haul to Southern New England Mills

is growing to maturity and demanding his place in doing his bit for Uncle Sam.

The motor truck salesman of yesterday must be awake to the vital signs of the times. He must undergo another course of schooling. He must broaden his views of business beyond the realm of his salesrooms. He must look out through the open windows into the

of his department a few days ago that he had discouraged a prospective purchaser of a high priced motor truck from buying a truck at all. The department head was amazed. The prospect had been all but signed up on the truck in question.

"We might have sold one truck to that man and made our profit on it."

The Stern Necessities of War Have Opened the Eyes of the Conservative Yankee

showed the customer that he was making a mistake in buying a truck before his business was assured and he showed the customer how he could go out and get business that was fairly screaming for somebody to come and get it. He showed that customer where there was waiting business, "put him in right" to get it and he knows that when that man comes back, be it a few days or weeks or months, that he will come back with success assured at the outset and with so big a list of clients to be taken care of, that one truck will not suffice.

He is one of the truck salesmen who is looking ahead. If he had closed the deal for one car, ten chances to one it would have been the only truck he would have sold; ten chances to one the man would have failed financially within a very short time; ten chances to one that the man would have believed the high priced truck was largely to blame for his failure. He didn't want a "knocker" on his list. He wanted a "booster." He wanted his truck to make good. He wanted the man to succeed but most of

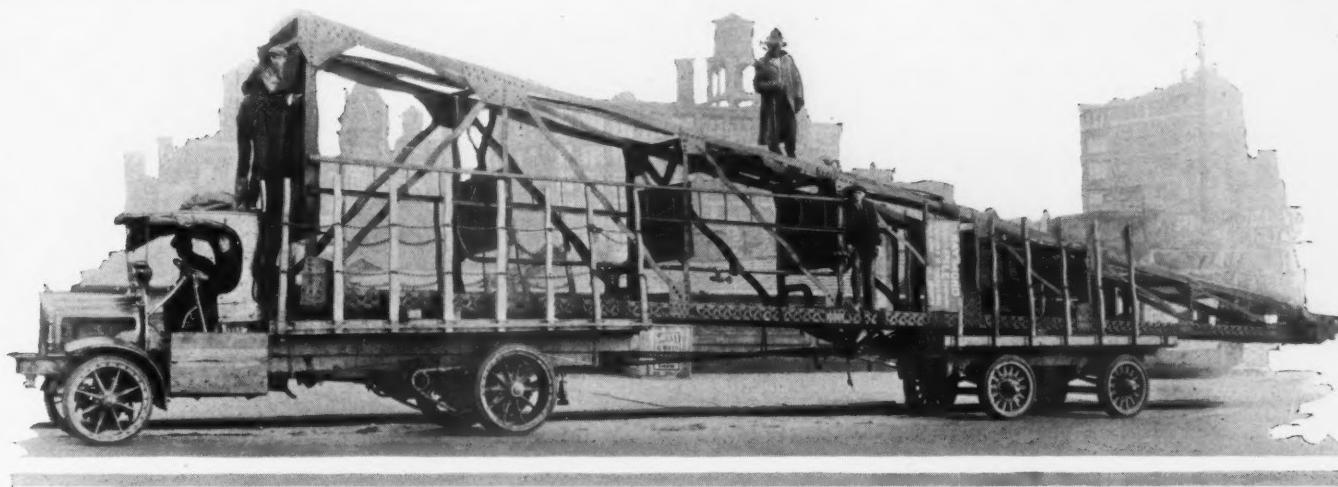
If he doesn't build for the future, some fine day he will awake to find the war is over and his business has blown away with the smoke of battle.

New England is particularly well situated from a transportation standpoint to make the operation of motor truck freight lines popular and profitable. The railroads serving New England operate without competition from other railroads. There are three railway systems handling the bulk of the business, one coming from New York and the South, one coming from the West and one from the North and Northwest. Semi-independent lines haul only to junction points of these other systems—they do not compete.

Therefore, if an embargo is placed on certain lines of goods by a single one of these three railroad systems, it affects the whole of the New England territory. If preferential classes are provided, it affects New England. Boston is the junction point of the three systems. If freight is to go beyond Boston in any direction, it must be transferred from

Boston frequently took as long to be delivered at their destination as though they had come through from the middle west for delivery at Boston. Transportation engineers in Boston have not yet put into operation any scheme for overcoming that delay. But since the advent of the motor truck the successful independent express and truckmen have partly relieved the railroads of these short hauls of freight and the business along these lines is growing by leaps and bounds.

Motor truck freight is not limited to this class, however, for already there is in successful operation a line of motor trucks in direct competition with a single line of railroad. The Cressy Contracting Co., Boston, has put into operation a 20-hour motor truck freight service between Boston and New York and is making its schedule. Early winter storms have affected the schedule but little—even less than they have affected the railroads—and the three Pierce Arrow trucks have for several months carried full loads in both directions.



Truck and Trailer Moving Pile-Driving Tower to Atlantic Naval Base From Distant Point, on Four-Hour Notice

Turntables, bed sills, boilers, engines and other equipment were similarly moved and in operation in twenty-four hours.
Railroads would not guarantee delivery in ten days

all he wanted his truck to succeed. He didn't go around with his eyes shut when he left the salesrooms. He learned shipping conditions. He learned who was being the most seriously affected. He made a few inquiries and he learned just where the root of the whole matter lay. He gave tips to his customer which may mean thousands of dollars to the customer and thousands of dollars to the salesman's concern. He won the confidence of the customer and when any of that customer's friends want a truck—you can guess who will get the business.

Nobody knows how long this war is going to last. Everybody knows that the war is making opportunities every day in almost every line of business and the man who takes advantage of these opportunities, yet builds for the future, is the man to whom success is assured.

one system to another. Transfers of freight mean delay at the transfer points, particularly at the present time. Delays mean loss to consignor and consignee. New England business is therefore awakening to the fact that while it has heretofore been charging transportation only in its item of freight, it should all this time have been charging delay to the same item and that whereas railroad rates might in themselves be less than express rates and while express rates might (although in many cases they are not) be higher than motor truck rates, the charge for loss of time does not enter into the motor truck rates at all but goods are delivered in the shortest possible space of time in which man and machinery can operate.

Freights coming from a few miles south of Boston to a few miles north of

"Two factors must be borne in mind if you would successfully operate motor trucks," said Manager Ennis, of Youlden, Smith & Hopkins, one of the largest of Boston's trucking concerns. "You must carry a full load both going and coming and you must keep the wheels in motion."

Boston's most ambitious long haul motor truck freight business is operated by a woman. The Cressy Contracting Co. is owned and operated by Miss Eva H. Cressy. To prove that it is a success, one needs but to say that two weeks ago the company vacated its offices at 278 Albany St. and moved to 140 Dover St., in order that larger offices could be obtained for the increased business being handled. This office adjoins a spacious new garage wherein the trucks are housed.

You Must Carry a Full Load Both Going and Coming and Keep the Wheels in Motion

"The Boston to New York motor freight line was more or less of an experiment," said Miss Cressy. "My business required many trucks in the summer and there was no use for them in the winter months. It was to keep the trucks moving in the winter that I hit upon the plan of operating the through expresses."

"I planned to put one truck at work and fully believed that if I could operate one truck on a 20-hour schedule it

Another feature of the motor truck freight business is that if a large shipment is made for delivery to a city outside either Boston or New York, it can be carried direct to those points and delivered just as readily as though delivered in New York's business center, with only the additional labor of establishing the extra freight haulage charges to cover the increased run. Thus a recent New York shipment was carried to Nashua, N. H., instead of to Boston,

woman in motor freight will be obliged to figure out another plan for winter use of the trucks which she will have to add to her already large fleet to handle the paving business this coming summer.

The basis for figuring charges on the Boston to New York run is one cent per pound. No single shipment from a firm under 500 lb. is considered, thus the maximum number of shippers represented by one trip would be 20 but it very often happens that one shipper contracts for the entire capacity. The smaller the number of shippers and the smaller the number of consignees, the more economically the load is handled.

Youlden, Smith & Hopkins, of Boston, have been successfully operating trailers with their trucks. One Mack truck and trailer are daily carrying 20,000 lb. of merchandise between Boston and Brockton. Another truck and trailer carries a slightly lighter load between Boston and Chelmsford, Mass.

Under the prevailing wage scale, trucking companies figure the operating cost of a five-ton truck per week as follows:

Wages of chauffeur and helper....	\$44.00
Gasoline (about 100 miles daily)...	33.60
Oil	3.50
Tires	5.90

Total \$87.00

If the haul is a long one requiring more than a single day for the round trip, allowance must be made for the room for the men to sleep and usually some special arrangement is made re-



One of Three Five-Ton Pierce-Arrow Trucks in Boston to New York Regular Service. Trucks Leave Boston Every Monday and Friday Morning, and Operate on a Twenty-Hour Schedule Each Way.

would take care of all the business or rush freight which business men wanted moved between these two cities. I was mistaken. Three trucks which I now operate are loaded as fully as we dare load them for the long trip and there is more business coming to us all the time.

"We collect freight right at the shipper's plant. We deliver it at the door of the customer. The same truck which makes the long trip also collects and delivers the freight. We allow a day loading and unloading. The trip each way takes two days, allowing for a stop-over in some city where the chauffeur and helper get their night's sleep. Thus the round trip with collections and deliveries takes up a full week for each truck. There is no handling and re-handling of the merchandise. One loading puts it aboard the truck and it is not disturbed again until it is unloaded at the customer's door."

The Cressy company, during the summer months, is engaged in laying asphalt coverings for highways and operates in all sections of New England. Freezing weather ends that work until warm weather comes again. The trucks of other firms engaged in similar business, stand idle during the winter. With the Cressy company, the big tank bodies are removed, truck bodies replace them and the trucks then engage in hauling freight. While the company is thus far using only Pierce Arrow five-ton trucks in the Boston to New York hauls, so rapidly is the business growing that five Packard five-ton trucks owned by the company may soon be engaged in similar work. The Packards are already in use in shorter hauls.

making an increased haul of some 80 miles round trip over the Boston mileage.

There is a demand for freight hauls between Boston and points north of New York, but as yet no regular schedules have been adopted by the Cressy company for handling this on a regular schedule basis. Trips are made by the Packard trucks whenever a full load is



Mack Truck With Trailer Attached, Carrying Practically One Continuous Load

secured, to Springfield, Providence, Pawtucket, New Haven or other places and in almost all cases return freights to Boston are readily secured. With the increasing growth of the hauls to these latter places, however, it is probably a matter of only a few months when regular schedules will be established. Moreover, this part of the business of the Cressy company is working out so well that it will be continued throughout the year and Boston's pioneer business

garding an allowance for a certain number of meals for them.

These figures do not include interest on investment, depreciation, repairs, insurance, lubrication (in addition to oil) and such items. In many cases, however, the wages of the chauffeur and helper are much lower than in the above, ranging from \$33 a week up to \$44. The items of expense vary with every make of truck, as well as with the various capacities of the trucks.

"One Loading Puts It Aboard the Truck; It is Not Disturbed Again Until Unloaded"

Within a radius of 25 miles of Boston over forty express companies are operating one or more trucks varying in capacity from $\frac{1}{2}$ to 5 tons, according to the class of material which they carry. All of these are engaged in inter-city business and in more than 60 per cent. of the cases the companies are in competition with one or more similarly operated express businesses.

The big retail houses of Boston, Portland, Me.; Worcester, Springfield, Providence, New Bedford, Fall River, Pawtucket, Lowell, Lawrence, Portsmouth and other New England cities all operate motor trucks to the suburbs of these places. The big manufacturing industries have their own trucks and frequently use them in long hauls or between plants located in different cities.

No Congestion With Trucks

The Boston post office, which includes within its jurisdiction several hundred sub-stations in the suburbs, has recently displaced all its horse-drawn vehicles, trolley cars, etc., with motor trucks and in the recent Christmas rush Postmaster Murray says that never before have the mails been so quickly handled and not once this year was there the least congestion. "Credit for the handling of the mails is due largely to the motor trucks. Mail was carried away as fast as sorted, and distributed among the suburbs. In past years mail has collected faster than it could be sent out of the office. This year the motor trucks were waiting for their loads."

For traffic from point to point within some of the larger New England cities, electrically operated trucks of both small and large capacity are being profitably operated, particularly in the cases in which concerns operating the trucks also operate electric power plants wherein they may recharge their own batteries. Many of the large mills, for example, use electrically propelled trucks to carry freight from the shipping room to the freight sheds or from mill to mill. In Lawrence, Mass., the Pacific mills operate several of these trucks in carrying supplies to and from their print works which are located two miles distant from the main plant, and as the mill operates its own power plant, charging of the batteries is done at a minimum cost, so that the electric trucks, while less speedy than either gasoline or steam, are nevertheless less expensive in operation to the mill. The same mill also has several gasoline trucks, some of which are used on long runs, including trips to Boston, Providence, Dover, N. H., and elsewhere.

The American Woolen Co. owns a large fleet of trucks and operates them not only about its several plants in the cities in which its mills are located, but also in carrying supplies between the mills.

With the delays in freight shipments and preferential handling of freight, many New England manufacturers are operating motor trucks to distant junction points where they secure their freight without long delays in rehandling and transferring from one railroad system to another.

Three of the big rubber companies of Massachusetts are using motor trucks almost continuously in bringing supplies to the factories, loading them on the outgoing trip with finished products for delivery in the city from which the supplies are obtained or, if none are for delivery there, then for shipment from that city to some other city on the direct line of the railroad passing through that city. This cuts down delays in shipping from local freight sidings and enables many rush orders to be handled which otherwise would be turned away.

Some manufacturers in New England are using trucks largely for shipping their products to railroad freight depots

Manufacturers have a distinct advantage over the trucking concerns in that they can almost invariably plan to send the trucks fully loaded going to and returning from their destination, while the truckman must sometimes do considerable hard work before finding a load which he can pick up for the return trip.

Furniture moving in New England is now done almost entirely by trucks and this work is generally a one-way haul only, but the higher rates obtainable for this class of work are figured on that basis. More than 80 per cent of furniture moved in what would ordinarily be carload lots, is now carried by motor trucks for there is no rehandling and repacking with its resultant large percentage of breakage when motor trucks are used. In the munition centers of southern New England several prosperous furniture moving concerns are operating, bringing to those cities the household belongings of the hundreds of em-



Mack Truck and Trailer Combination Carrying a Total Load of Twenty Thousand Pounds

This outfit is operated by a Boston trucking company, between Boston and Pawtucket. A similar load is daily carried to Chelmsford and a return load to Boston, a round trip of over eighty miles.

in other cities. This is especially true of industries located within ten or a dozen miles of two or more lines of railroads. They can thus load on the railroad which serves their customers direct without the long delays and additional charges caused by transferring and switching.

The shoe and leather industries are using more motor trucks every year in their business, largely for long-distance hauling of supplies and completed products. During the temporary shortage of leather, shoe factories have been enabled to load motor trucks in markets as far distant as New York, or at junction points with railroads coming from the west, such as Newport, Vt., saving many days' delay and oftentimes helping to keep the factories running with a full number of hands when temporary shut-downs would have resulted without the trucks. Some of these concerns operate their own box factories at points where lumber is easily available, among them the George E. Keith Co., which has a big Duplex truck and tractor to carry supplies to the box factory from Brockton, sometimes carrying loads of lumber, and returning with loads of finished packing boxes.

ployees moving there from the most distant parts of Maine, Vermont, New Hampshire and Massachusetts.

Operation of motor trucks by the big industries of New England has largely been placed on a cost basis by the efficiency experts in these factories. The general average is that it costs \$1 per hour to operate the 1-ton gasoline trucks, figuring in all costs such as wages of operator, gasoline, oil, tire, interest, depreciation, repairs and every item which is charged to motor truck operations. For the 3-ton to 5-ton capacity trucks two men, a chauffeur and helper, are required, so that the cost of \$1 per hour figured on the smaller trucks is increased. The larger trucks represent a larger investment, larger depreciation, larger interest and larger fuel costs, but as the load carried is several times that carried by the smaller trucks, the saving to those who can use fully loaded large trucks is considerable. These trucks are operated at about three-quarters of the cost charged when horses were used, but as horses were discontinued some years ago and as the companies have greatly expanded during the intervening years, there is practically no basis of comparison.

The Boston Post Office Has Recently Displaced All of Its Horse-Drawn Vehicles

Probably the longest regular run out of Boston is that to Akron, O., where the Goodyear Rubber Co. operates trucks to carry supplies to Akron and bring tires to the Boston market. A feature of these trucks is that they use pneumatic tires, and to withstand the heavy loads and the long journey they are equipped with the largest pneumatic tires manufactured—44 x 10 in.

Because of freight embargoes and preferential shipping rules, chambers of commerce throughout New England are getting information relative to the motor truck shipping.

Chambers of Commerce Active

The Boston Chamber of Commerce has taken up the question at length regarding shipments as applied to retail houses and at a meeting held just before Christmas plans were prepared for handling shipments by motor trucks in which 32 of the largest retail houses participate. This is only one of many steps to be taken by the Boston organization, for it is to be carried forward by the wholesalers in the handling of scores of products, including produce, meats, hides, wool, cotton and even grain as a method of relieving railroad congestion and increasing the supply to New England and to the seaboard.

In its latest bulletin to members, the Boston Chamber of Commerce says:

"Serious consideration is being given to the possibilities of motor truck transportation for freight shipments between Boston and other large New England centers, such as Providence, Worcester, Lowell and Portland, in order to relieve the prevailing freight congestion on the railroads.

"That such lines will be established seems assured if railway transportation for approximately five hundred commodities classified as non-essentials is prohibited by the Government as recommended by the Railroad War Board last month."

The Worcester (Mass.) Chamber of Commerce reports that it is now securing detailed information as to the amount and character of supplies being shipped between Worcester and Boston, Worcester and Providence and elsewhere with a view to learning how much of this material could go over the road in motor trucks. The Chamber further announces that it has both capital and rolling stock in readiness to put such a plan in effect as soon as the information is properly in hand.

Work has advanced even further in Springfield, Mass., where the Chamber of Commerce has already appointed a sub-committee on transportation. At a meeting of this committee held December 29, it was voted to experiment with a motor freight line between Springfield and New York City and to inaugurate the new line the latter part of January.

The committee will send notice of the new line to all of its members as well as to business houses shipping freight to and from New York, asking patronage for the line. This line will have the backing of the Springfield Chamber of Commerce but will be privately operated.

E. C. Southwick, traffic manager of the Providence (R. I.) Chamber of Commerce, is at work along similar lines looking to the relief of freight congestion through motor truck freight hauls.

At the next meeting of the Fall River Chamber of Commerce the question of motor truck freight haulage is to be one of the principal matters up for discussion.

The Portland (Me.) Chamber of Commerce is considering the question. Up to the present Portland has got around its rail congestion by using steamships to Boston and New York, but with the increasing shortage of ships which can be chartered for such

The Maine Highway Commission, which last year spent \$323,000 in road maintenance on through routes, will this year ask the State Legislature for \$127,000 more for the same work. Permanent improvement work by the commission last year cost \$636,000, and to this will be added \$440,000 this coming year to complete the work. With this expenditure completed, the state highways will be in condition to handle heavy motor truck traffic from all principal cities of the state.

J. J. Harmon, of Westbrook, Me., is operating a truck line to and from Boston, using heavy Packard trucks for the work. Higgins Bros., of Lewiston, Me., are operating similar trucks to all parts of the state of Maine. The United States Post Office Department will probably open a small truck route from Nashua, N. H., to Portland, Me., in the spring.

With some single truck loads of freight insured as high as \$50,000, the importance of the motor freight may be realized. Five tons of Red Cross sup-

Kissel Light-Body Truck in Operation Between Baltimore and Washington, Making Trips Each Weekday.



work, relief may be sought in motor trucks. The Packard Motor Co., of Portland, is taking steps toward the establishment of such a system and the information which it gathers will be turned over to the Chamber of Commerce for its guidance. Manager F. W. Holmes, of the truck department of this company, declares that by spring he hopes to see truck lines established between Bath, Me., and Boston, via Brunswick and Portland, which would give the line state roads to operate over the entire distance.

The Massachusetts Highway Commission has sent out notices to cities and towns throughout the state asking that the through highways be kept as open as possible during the winter in order that there may be as little interruption as possible to motor traffic, particularly to the carrying of merchandise by motor vehicles. With the commission already taking an active part in the work, the Legislature, which convenes this month, will undoubtedly take steps to not only keep the through roads open, but to continue, on a larger scale than ever before, the improvement of main traffic roads.

plies, loaded in Philadelphia recently, were carried in motor trucks over the 330 intervening miles to Boston for shipment. Frequent trips are being made between Hartford, Providence, New Haven, Springfield and other New England cities to New York, Philadelphia and other Central Atlantic points. The motor truck has entered the freight field at an opportune moment and when normal times return it will have become so firmly established that it will not be easily dislodged.

Smith Motor Truck Corp., Chicago, Ill., has been taken over by the creditors' committee as directors. David R. Forgan is chairman of the committee. The committee has obtained the consent of practically all creditors and declared the plan operative by agreement with officials and stockholders without court action. The committee has raised sufficient money for working capital, and according to the present plan the company's assets are to be worked into cars and sold with an effort to preserve the property as a going concern. Production is being increased under committee management.

The Commercial Car Has Entered the Freight Field at an Opportune Moment

The Short-Haul Ally of the Railroads

Why the Railroads Need Commercial Car Highway Transport Aid, and How They Are Already Getting It in Many Places

By GEORGE W. GRUPP

THE war has placed a grave responsibility upon every citizen, firm and industry in the United States. But upon the railroads "rests the immense responsibility of seeing to it that transportation suffers no obstruction, no inefficiency or slackened power," President Wilson has said. "As a whole it is being run more efficiently than it has ever been run in its history, but it must be run with still greater skill—skill progressively greater—as time goes on. The crowding of locomotive power, the scarcity of men and material, the pressure of congested conditions; all these things will make for lower standards in many ways unless resolutely faced and fought, and lower standards spell inefficiency. Transportation affects mansion and hovel, rich and poor, alike. It is vital to all."

Daniel Willard, president of the Baltimore and Ohio Railroad and Chairman of the Advisory Committee of the Council of National Defense, recently said: "The railroads will not be able, no matter how hard they try, to carry all the freight that will be thrown upon them during the war. They will probably be able to carry all the foodstuff necessary. They will carry the necessary coal and munitions, and they will carry steel to make ships, all of the things necessary from the standpoint of winning the war. It will take 75 per cent of their capacity to perform the service of the kind mentioned, leaving 25 per cent of the capacity for ordinary business of the country. Probably the ordinary business of the country, at the present time, requires double that capacity, so that part of it cannot be carried, and we must exercise judicious discrimination."

Trade Increase Since War Began

Since the beginning of this war our domestic trade has increased 50 per cent and our foreign trade 100 per cent. The railroads have been swamped by the unprecedented demand for coke, ore, coal, pig iron, munitions, hospital supplies and foods. The railroads haven't the necessary equipment to carry this increase in tonnage. They are handicapped, as it takes years to construct yards and freight facilities; and besides the immigrant labor element has been cut off. Yet in the face of all this, the railroads are doing their best. They are working night and day doubling and tripling the usual tonnage in freight cars. They have been speeding up the movement of cars with remarkable success. Locomotive and freight car daily mileage has been increased about 9 per

cent. over that of a year ago. The shippers, public and railroads through co-operation have made possible the intensive loading of cars, freight being unloaded more promptly, and the elimination of a large percentage of unnecessary passenger train service. This has spelt greater efficiency in freight service. More than that, some railroads have asked shippers to send all of their freight for a given point on a certain day of the week to enable them to load their cars more quickly, with less confusion, and it aids them in getting up a train, and to get earlier started, in the classification yards. But in spite of all this the railroads, as Daniel Willard has said, will not be able to care for all of the freight traffic. This being so, who is going to carry it?

There is only one answer to the problem with which the railroads are struggling—motor trucks, road tractors and trailers. Howard Elliott, ex-president of the New York, New Haven and Hartford Railroad, while in Washington last June pointed out, in an indirect way, the great opportunity of the motor truck during this national crisis as the short haul ally of the railroads. Railroaders know that short haul shipments require almost as much time to load and expense to perform the work as a car that is to be shipped across the continent. It was J. J. Hill who once said that a freight car when once on its way could easily travel 250 miles in a day, but because of the congestion at terminals they only averaged 20. This average, however, has been increased to 29 miles. The reason for this delay at terminals is because all tracks lead to it but none out; because some shippers like to use freight equipment as a storage plant, and because considerable time is consumed in making up trains in the classification yards. These reasons are sufficient to convince one that road transports, which are more swift, are better for short hauls. They should be employed to relieve the railroads of their short haul shipments in order that the locomotives and cars thus used may be utilized for long haul traffic.

What One Railroad is Doing

There is no real reason why road transports should not be used for short haul freight by the railroads during this crisis. The Cleveland, Cincinnati, Chicago & St. Louis Railroad is using a 5-ton truck to haul less than carload lots between their sub-stations on Front and Sixth Sts. and Brighton and Ivorydale and the main station on Central Ave. in Cincinnati. The truck is equipped with nine demountable bodies so that no time is lost in waiting

for a load or to be unloaded. This outfit has replaced their trap car service. It hauls about 84 tons a day, carrying on the average a load of 4.55 tons. After a careful study of this truck and the trap car service, it was found that the latter's movements required 1½ days to do the work. With the road transport the haul of a trap car load of 9 tons of freight an average of 3 miles within a radius of 9½ miles is only 1 hr. and 24 min. This has not only meant a saving of much time, but money and floor space as well.

Advantages of Road Transports

Only a little study of railroad freight costs will convince one that a large share of the freight charges go to pay for the upkeep of freight terminals, loading and unloading and the like, while only a small part of it goes toward the cost of actual hauling. Therefore the short haul freight charges must of necessity be proportionately higher than long hauls.

Here is where the road transports have the advantage over the rail transports. Terminal expenses can be cut down by calling at the shipper's place, if it happens to be along the course of the route, and thus save several handlings of the freight. The Capitol City Transfer Co. of Olympia, Wash., claims that it is able to haul furniture to Seattle, a distance of 90 miles, (furniture being only one example), at an expense of one quarter less than railroads.

The brewers were the first in this country to recognize this advantage which the road transport has over the railroads in short haul shipments. Every brewer in New York City uses a fleet of gasoline trucks, and some with trailers, for all deliveries within a radius of 50 miles. When some of the brewers were asked why they preferred road transports to railroads they replied that their customers could not wait until a freight train arrived, and especially when they were caught short. They say that with reasonably good roads the road transport is a wonder for short hauls.

In spite of the fact that road transports require more effort per ton for propulsion than rail transports they have some very distinct advantages over railroads. First, they are able to compete with railroads because the investment in their installation is not so great. This means that they need not haul as much freight as rail transports to obtain a given profit. Second, they may be shifted from one section of the country to the other with greater ease than rail transports if it has been found that the traffic is too light to warrant their operation, and particularly when the service is

Road Transports Should be Employed to Relieve Railroads of Short-Haul Shipments

entirely experimental. If the traffic for road transports proves remunerative, and traffic increases, the carrying capacity can be much more easily increased; and should the traffic develop to sufficient size a branch line for rail transports could be constructed. Third, road transports can climb grades and round curves which no freight train could make. Therefore they are the natural allies of the rail transports.

Road transports can easily handle such freight as agricultural products, animals and animal products except large animals in which there would not be sufficient profit, mine and forest products, and all kinds of manufactured commodities within a radius of 60 to 100 miles. All of these commodities can be hauled much more quickly and cheaply by road than by rail.

It is because of poor train service that farmers within easy reach of the big centers have bought trucks and carry their own freight to market. They want their perishable goods delivered promptly. Slow movement of perishable goods causes food prices to soar. Besides, an unnecessary waste of foodstuffs is hazardous these days. Waste means just that much handicap to winning this war.

Organizing Road Transportation

Before placing road transports in operation a careful study should be made of traffic statistics in the particular district under consideration and the conditions that effect the volume of traffic such as population of the community under consideration, and the topography of the country. From experience it has been found that agricultural districts will offer a steady volume of traffic; mining districts offer an erratic volume; in manufacturing districts traffic is spasmodic while pleasure resort traffic fluctuates.

Other things to consider are the building of shipping stations, routes and road conditions, road gradients, garages and time schedules. Shipping stations must be built for the convenience of the shippers. A garage must house the road transports. And it should be fully equipped to care for any repair or emergency whose superintendence should be in the hands of a competent man.

Routes must be laid out with due consideration given to both roads and gradients to prolong the life of the vehicle and in order that it may maintain its scheduled speed. When a given tonnage is to be hauled to a given point the grade and road resistances and power necessary to overcome the resistances should be computed so that the right sized truck or tractor is selected.

Mechanical means of loading and unloading should be installed at the terminals so that the smallest amount of time is taken up for loading or unloading. A fleet of trailers should be provided if road tractors are used so that trailers may be left at either point while others are in transit. If trucks are used demountable bodies should be provided. Winches and like auxiliary devices are valuable accessories for road tractors and trucks. No truck or trailer

should ever be overloaded, nor underloaded if profits are not to be cut into and costs per ton for haulage increased. And lastly, only competent drivers should be employed. This is very important if road transports are to be run effectively, efficiently and not ruinously.

Commercial Car Operating Costs

While this is a question of paramount importance, it is impossible to give a hard and fast figure as to actual cost. Cost figures are governed largely by the kind of drivers employed, the type of transport used, whether the transport is being over or underloaded, road conditions, resistances on road and grades.

The Motor Truck Transportation Co. of Chicago which operates a fleet of trucks that carry an average load of 7.375 tons is a typical example. Its experience over a given period was as follows.

Mileage of Route	Cost per Ton-Mile
96	\$0.0259
89	.0269
35	.0241
15	.0242
45	.0242

A little study of the above figures will prove that not all trucks can be run with the same degree of economy, this for the reason that drivers, road conditions, etc., must be taken into account. No two railroads operate with the same amount of economy. But for all practical purposes let us compare these figures with the estimates which T. M. R. Talcott, a railroad expert, claims it costs the railroads to operate per ton-mile.

Mileage	Cost per Ton-Mile
10	\$0.06198
50	.01825
100	.01279

A comparison of these figures and those of the Capitol City Transfer Company's quoted previously, indicate that road transports are quicker and more economical than railroads when it comes to short hauls.

During the great freight congestion in New York a road transport service was in daily operation between Bridgeport and New York City.

A firm in Topeka, Kan., operates a fleet of trucks within a radius of 40 miles. On outgoing trips they carry ice groceries and other supplies. On their return trip they haul poultry, eggs, vegetables, etc.

The Big Auto Stage Co. hauls freight from Madera, Cal., to the Sugar Pine Lumber Co., a distance of 80 miles one way. From Friant to Sugar Pine, a distance of 60 miles, the roughest kind of mountain roads are encountered.

For a number of years the California Hot Springs Transportation Co. has been a freight carrier between California Hot Springs and Ducor—a run of about 25 miles. The transports enroute are obliged to climb grades from 15 to 20 per cent. This would be a tremendous task for a locomotive.

Thompson & Smith operate a fleet of 14 trucks for passenger service between Bakerfield, Cal., and the oil fields—such as Kern River, and the West Side Oil Fields connecting with such towns as Oil Center, Taft, Maricopa, McKittrick, and Fellows. They also operate lines between Fresno and Kingsburg; also between Fresno and San Francisco and Los Angeles. And before long they will be hauling freight as well as passengers.

Out of Philadelphia the Motor Transit Co. maintains a daily service between Phil-City and New York. J. B. Owen, of Clarksadelphia, Wilmington, Trenton, Atlantic boro, N. J., has built up a very profitable freight business between truck farms in south New Jersey and Philadelphia.

Between the Cataract City and Buffalo, William Young, of Niagara Falls, N. Y., operates a fleet. M. A. Hosmer operates trucks between Buffalo and Williamsville, while another concern in Buffalo—the Bogold Brothers, hauls freight within a radius of 100 miles.

The most important road transport line running out of New York City is the Paterson & New York Express Co. It runs four road transport trains a day. Each truck hauls on an average of 360 ton-miles a day. At present a company capitalized at \$1,000,000 is being organized to carry freight within a radius of 100 miles of New York.

A line operates out of Minneapolis to Anoka which distance, 22 miles, it makes in a little over an hour. Because of the vast amount of switching and checking which is necessary when shipping by rail, it takes from 3 to 5 days to make the same delivery of freight.

Others who operate successful road transports are the W. A. Good Transportation Co., Dayton, O.; T. N. Pugh, Montgomery, Ala., and the Lloyd Transfer Co., Seattle.

From the few illustrations mentioned, the practicability of hauling freight with road transports is amply demonstrated.

Motor Freight Hauling Rates

Road transport freight rates should be figured with the same degree of accuracy as are rail transport rates. Road transport men should base their rates on the capacity of their vehicle and then compare it with the density of the commodity; also whether it is bulky and light, and as to whether a truck or trailer load is to be hauled. Further, in arriving at a rate they should not neglect to charge for the cost of space wasted if the goods hauled necessitate such waste, the expense of loading and unloading, the amount of traffic to a given point under consideration, the amount of goods to be shipped, the risk assumed in hauling freight, the cost of carrying dead weight such as trailer and tractor or truck, for special facilities used in loading and unloading, for freight terminal facilities, the cost of operating and maintaining the vehicles and the fixed charges on the entire equipment. But in keeping an accurate cost account, the fact that a performance record is essential to discover leaks should not be neglected.

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	1916	1917	1916	1917
CCJ	- - - - -	146	198	109 157
2nd Truck Journal	-	86	108	49 61
3rd " "	"	65	65	43 48
4th " "	-	41	51	28 37

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TRUCK REPAIR DEPARTMENT



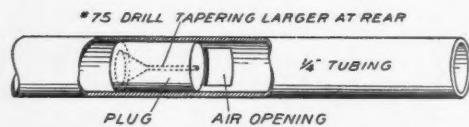
Contributions for this department are invited. All accepted matter will be paid for at our regular rates and in addition an extra \$5 will be awarded each month to the author of the letter describing the most generally useful or unique repair.—Editor.

Some Homemade Handy Tools

Generally speaking, it is poor economy to make tools that can be purchased at little expense, particularly if they are for frequent use. Manufacturers specializing on tool production have the facilities for turning out better tools at less cost, time and all considered, than the average repair shop. Most shops, however, have the material at hand and often slack time of men that can be profitably turned into the making of special tools that it would not pay to buy. There is lots of opportunity here for the ingenious mechanic to equip himself for handling subsequent work with materially less waste of time than if he managed to do without or waited to procure the right tool for the work.

Herewith are described four handy devices that can be made from scrap stock representing practically no outlay except the work of making them and this is better than wasting the odd moments when the shop is not busy.

A tool that would be frequently used if available is a small hand gas torch. One may be made of a piece of $\frac{1}{4}$ in. tubing about 6 in. long. One inch from one end file an opening on each side of the tubing with a thin file; do not make the openings too large. Take a taper pin and cut a section out of it that will fit the tubing tight enough so that when pushed in it will not let the gas leak by. Drill a small hole



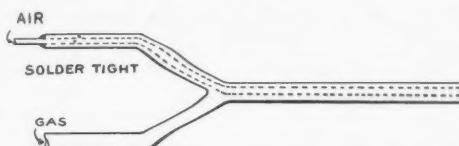
A Good Gas Torch Can be Made From Tubing

through the center of the plug tapering larger at the rear as shown in the detail of the plug. Use about a No. 75 drill for the small hole. Then push plug in so that front of plug will come almost flush with openings in tubing. Connect to a gas supply with a rubber tube of any length. If the torch gives a white flame make the air openings larger until it gives a hot blue flame.

It is very convenient to have several different sizes of these torches, as they are handy when repairing radiators and wiring on cars. The one described above is useful when overhauling storage batteries, as the flame can be kept on the knife or tool while cleaning the sealing compound from the tops of cells, and one will not have to be stopping continually to heat the tool.

For work requiring higher heat a handy torch can easily be made of scrap tubing found around any shop. Take a piece of 5-16 in. about 6 in. long for the barrel. Then get a piece about 12 in. long and

small enough to slip through the 5-16 in. tube, leaving a small space all around for gas. Cut the four pieces for the handle and fit them before starting to solder, so it will have the shape of a curling iron. First slip the small tube into the 6-in. barrel so that the ends come flush. Have ends clean so



A High-Temperature Gas Blow-Torch

that there will be no burrs. Then bend small tube out so that the first section of handle will slip on, then bend it back parallel to the first part for the last piece of handle. Finally, lay other pieces of handle in place and solder, being careful to make all joints air tight and not to fill gas passage. Where air tube comes out of handle be sure and solder it to gas tube so there will be no leak. Connection to air and gas supplies can be made with any length of rubber tubing. Have valves on air and gas pipes to control pressure before it enters rubber tubing.

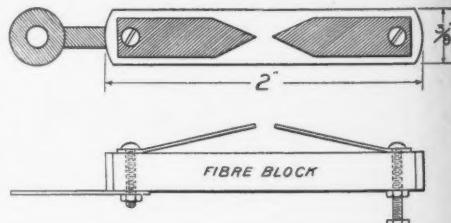
This torch is very handy in soldering radiators and for use in places that are hard to reach with an ordinary torch, as it will give a small blue flame. Here again it is desirable to have several different sizes for different kinds of work. If oxygen is used in connection with gas, the flame will be hot enough to do light welding and brazing.

Numerous devices are on the market for grinding valves, most of which have their merits, but lacking one of these a very serviceable one can be made easily. The

frame or stock should be $\frac{1}{4}$ -in. drill rod or 5-16-in. cold rolled steel. Care should be taken that frame is true or an even pressure on valve cannot be obtained. The head can be made from a discarded valve by cutting off the stem and drilling a hole almost through to receive the frame. A groove can be filed around top of frame to receive the point of a set screw to keep head on and still let it turn freely. The base should be a piece of $\frac{5}{8}$ -in. cold rolled steel about $\frac{3}{4}$ in. long, with a hole drilled in center to receive end of frame which is to be pinned or screwed in securely. It should be cut out with a hack saw and file, as in the accompanying detail, so that adjustable fingers will be in center of end of the frame. A 10-32 round head machine screw should be used to hold fingers. These can be made of $\frac{1}{8}$ -in. square steel filed round on the points to fit into the valve.

Another detail in the drawing shows a piece of sheet steel cut to take the place of the fingers for valves having a screwdriver slot in them. The point is to go in the center hole of the valve to hold the grinder in place.

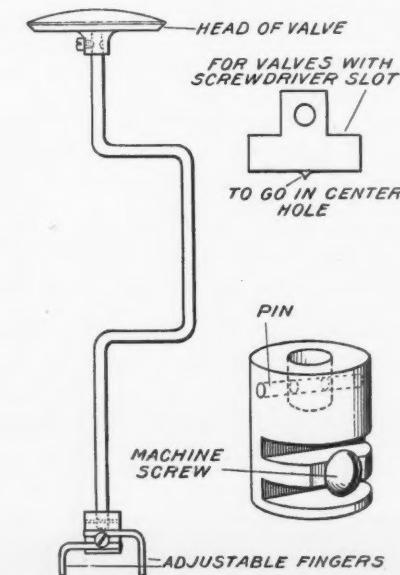
Means for testing spark plug action can be made by cutting fiber blocks about $\frac{3}{8} \times \frac{1}{4} \times 2$ in., one for each cylinder. Cut strips of soft sheet copper about 5-16 in. wide (two for each block), and long enough for the points to touch when placed flat on



A Handy Device for Testing Spark Plugs

the blocks. Drill a hole through the end of each strip and each end of fibre blocks to receive a small machine screw. Have one terminal for each block held on by nut of the screw that holds one copper strip. The screw that holds strip on other end should extend out about $\frac{1}{4}$ in. after nut is on and it should have an extra nut to hold plug wire. Fasten testers to plugs and connect spark plug wires to other end. Press copper strips down so that their points touch to make motor start easy. After motor is running take a screwdriver and raise strips, so that their points have a small gap for sparks to jump across.

By running motor at different speeds and watching testers, and changing spark gaps to different widths, weak sparks can be detected. Be sure that the spark plug points are all set the same during test.—C. B. Cleaveland, South Bend, Ind.

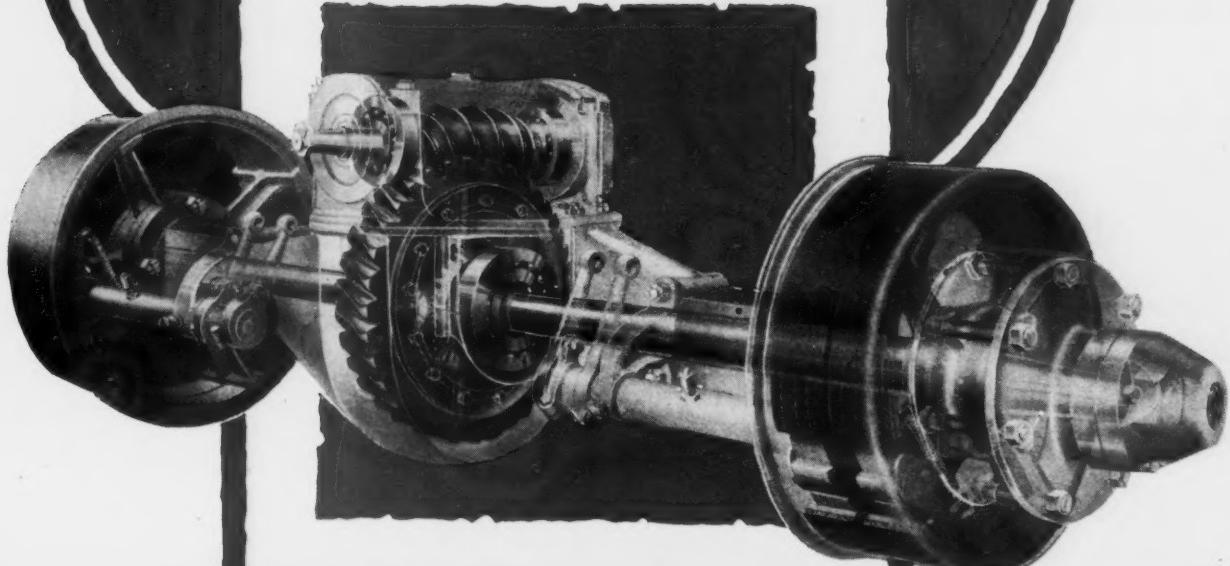


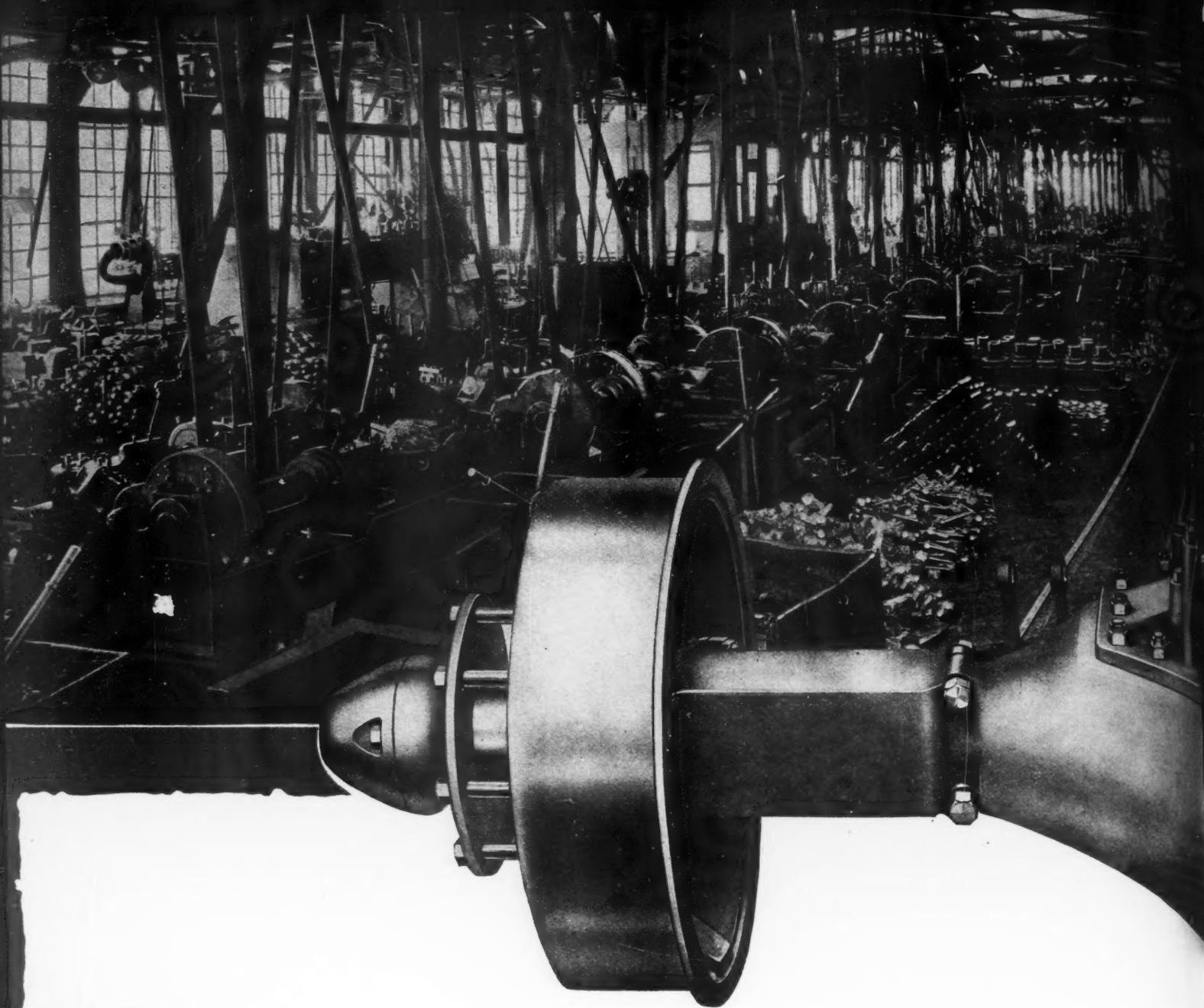
An Adjustable Tool for Grinding Valves





WHY MAKERS of GOOD TRUCKS USE **SHELDON** AXLES



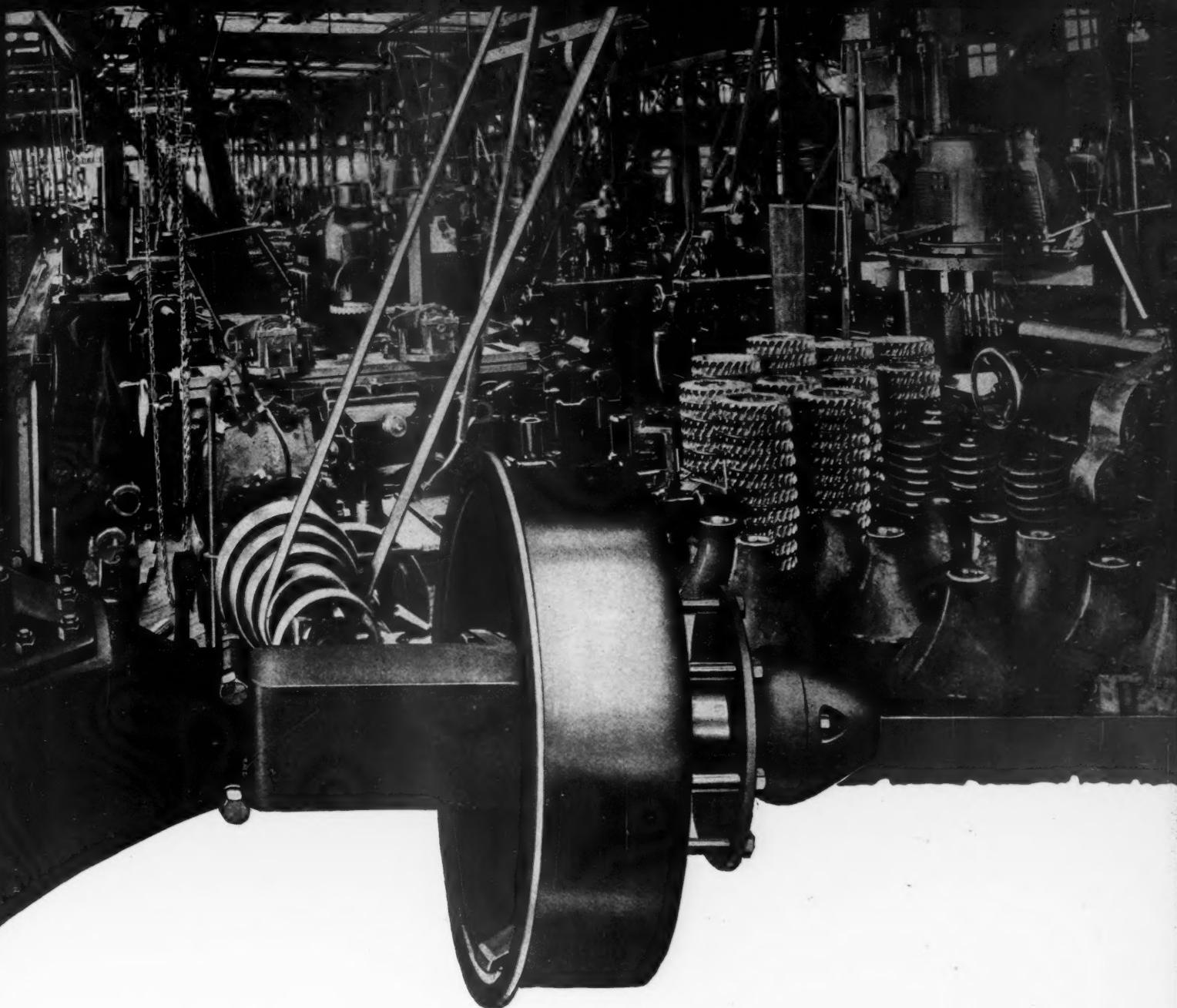


BUYING rear axles is a serious question—and one that does not receive sufficient consideration from many truck makers. Many of them are so concerned in developing the front end of the truck that by the time they get to the rear they have to cut down on the costs—and, consequently, invite trouble. As a matter of fact, some rear axles require even more attention than motors. Hence great care should be given to their selection.

Makers of good trucks realize this and take particular pains to secure rear

axles that will stand up and give long life and continuous service. They know that a truck must be built from the ground up—as are all things that endure. That means getting the right kind of axles.

Therein you have the reason why so many particular makers use **Sheldon Axles**. They are not built to compete in price with any other make. On the contrary, they are the highest priced axles in America. They are built to be the best axles made. The higher price is not due to complex design or intricate construction, but to maintaining the highest



standards known to the axle world, in the selection and testing of materials, workmanship, and precision of manufacture.

Some people in the trade may think we are too finicky about our specifications and assert that no other axle maker in the industry attempts to live up to such high standards. If they did but know it, that is one of the reasons the makers of good trucks buy Sheldon Axles—they know that very "finickiness" is due to our desire to have everything exactly right and that it is a guarantee to them of long and efficient service.

By being so particular in every step of manufacture we give Sheldon Axles qualities which they otherwise would not possess. We reduce friction to the very minimum, set up smoother operation, promote longer life and put operating costs on new low levels.

These things count with makers of quality trucks and they buy Sheldon Axles because they know that in paying a higher price for them they are getting a value that has no parallel in the axle field.



SHELDON AXLES

Outstanding Features of Sheldon Superiority

Semi-floating Construction—giving greater carrying capacity than the full-floating type and greater accessibility.

Simplicity of Design—calling for fewer parts.

One-piece Housing—stronger and better than the built-up type.

Lighter Weight—weigh less than others of the same carrying capacity.

Efficient Brakes—double internal expanding type, simple in operation, self-intensifying, easily adjusted, powerful, quick-acting, sure.

Ball Bearings—for the worm. Less friction, greater load capacity, free from adjustments.

Wheel Bearings—enclosed in main axle housing, easily accessible, permits easy demounting of wheel.

Strong Differential—broad, thick teeth; each gear supported on both sides, assuring absolute alignment.

Husky Drive Shaft— $3\frac{1}{2}\%$ nickel-steel forging, accurately proportioned, expertly heat-treated and ground to size.

David Brown Type of Worm—more silent, simple and durable. Machined to micrometer limits.

Further particulars on request

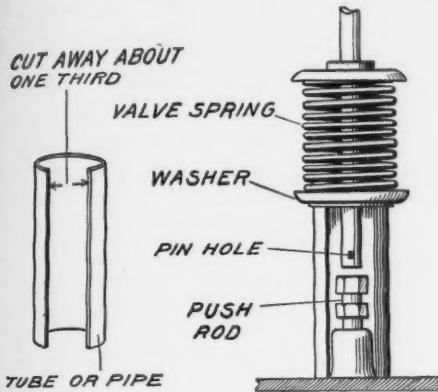
Sheldon Axle & Spring Company
Wilkes-Barre Pennsylvania





Valve-Spring Compressor

The quickest and best valve lifter or holder is made in this way: Take a piece of $\frac{1}{4}$ or $\frac{3}{4}$ -in. pipe just long enough to slip between the valve spring washer and the engine base when the valve is fully open. Cut away about one-third of the pipe so it can be slipped around the push rod and



Use of Cut-Away Pipe to Hold Valve Spring

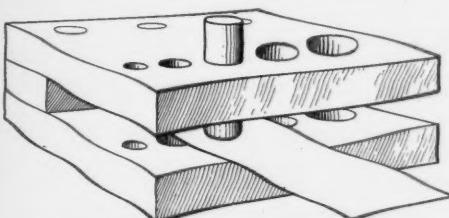
valve stem, this to be done when the valve is open. Then turn the engine until the push rod goes down, tap the valve down through the washer so that the pin can be removed and you are ready to grind the valve. The spring and washer remain in place while the valve is being ground. All that has to be done when the valve is ground is to drop the valve in and insert the pin, turn the engine so as to release the pipe holder and everything is in place.—H. L. P., Brainerd, Minn.

A Useful Shim Punch

Every car has bearings of the split adjustable type and most of these are adjusted by the use of shims.

In working on such bearings new shims are often needed and making them is a most exasperating job, or rather the hole is, as the rest is easy with a pair of tin snips.

By making a simple disc and a few punches neat clean cut holes can be put right



Homemade Die for Punching Thin Shims

where they are wanted in any ordinary shim stuff without waste of time or material.

For the die take two soft steel plates at least half an inch thick, three inches by four and a strip of bar steel one half by one, four inches long.

Rivet them together with three or four three-eighths countersunk head rivets.

Then drill holes with sharp drills through both plates about half an inch from the edge, using drills a sixty-fourth of an inch larger than $5\frac{1}{16}$, $\frac{3}{8}$, $7\frac{1}{16}$, $\frac{1}{2}$ and $\frac{5}{16}$, as they are the size bolts ordinarily used.

The die is now case hardened by immersing in red hot cyanide for half an hour and then dropping in cold water.

We use a pot made of a piece of large gas pipe with a sheet steel bottom welded in by the oxy acetylene process for case hardening, babbetting, etc.

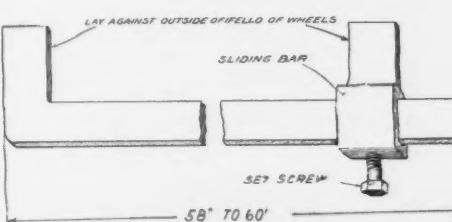
Made of scrap stuff they are cheap and very satisfactory. Next make a set of punches square ended or even concaved a bit, to fit the holes in the die snugly.

These may be of soft steel case hardened like the die or of tool steel and tempered. The sketch shows the tool better than it can be described.—J. A. Nightingale, Fairmount, Minn.

A Universal Wheel Aligner

The sketch shows a cheap and practical aligner to true up front wheels for any make of car. This tool is composed of a piece of straight steel or iron, say about $\frac{1}{4}$ in. thick, $1\frac{1}{4}$ in. wide and from 58 to 60 in. long. Bend one end up 2 in. Leave the other end straight. Then from a piece of steel or iron make an adjustable runner that will slide on the steel rod easily. Weld a piece on this runner that will project up the same distance as the bent end of the rod. Drill a hole in the back of the runner and tap a $\frac{1}{4}$ -in. thread for a stud to fasten it to the steel rod.

When truing up front wheels the front part of both wheels should measure about



Tram for Testing Front Wheel Alignment

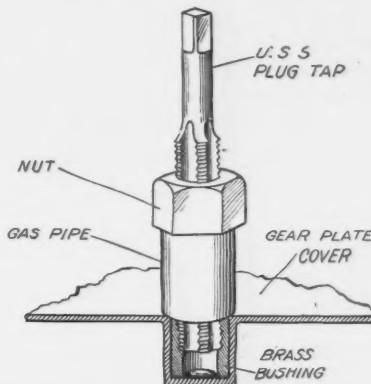
$\frac{1}{4}$ in. shorter than the back part, taking the measurements about the center of the wheel by placing the stationary curved end of the aligner on the outside of the felloe of the right wheel and moving the sliding bar in against the felloe of the left wheel back of axle. Then tighten the sliding bar with the set screw and try both wheels in the front. By lengthening out or taking up on the steering rod the front wheels can be toed in until they pitch toward each other $\frac{1}{4}$ in.—Stanley Slosser, Hazleton, Pa.

Homemade Socket Wrench

In taking off and putting on flywheels and anything having an extra large nut in a recess, socket wrenches are especially useful. When I do not happen to have the size needed, I take a piece of pipe about the same size as the nut, heat it and hammer the end to fit the nut, cool it in water and I have a good wrench for the job. A pipe wrench can be used to turn it with, or holes can be drilled in the pipe for a steel pin to be used as a handle.—H. L. P., Brainerd, Minn.

Extracting Set-in Bushings

Anyone that has tried to extract a bushing from a gear case where the bushing is set in and only one end left exposed knows



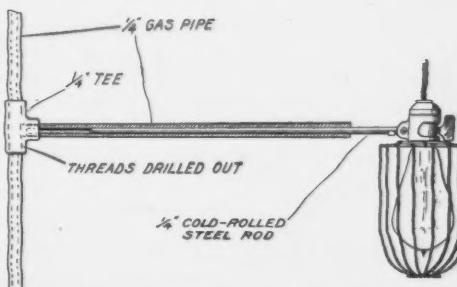
Pulling a Bushing That Cannot be Driven Out

it is not very easy. I have found the following a successful means for doing a clean and quick job:

Screw a U. S. Standard stub or plug tap into the bushing, about three or four threads to secure a good hold. Next, slip a piece of gas pipe over the tap just a little larger than the brass bushing and screw a nut of the same thread and size as the tap down on the pipe. With a wrench continue to turn the nut. This will pull the tap out and the bushing with it.—Geo. F. Kunze, Sleepy Eye, Minn.

Electric Light Bench Bracket

A handy electric light bracket can be made for use over a bench vise with two pieces of $\frac{1}{4}$ -in. gas pipe, one tee, a piece of $\frac{1}{4}$ -in. cold-rolled steel rod and a piece of sheet brass or tin to form a clamp for the light socket. Fasten one piece of the pipe upright on the bench across from the vise, then screw the tee on the other piece of pipe and drill out the threads to allow the tee to slide up and down the vertical pipe. The rod clamped at one end to the electric light socket slides in this horizontal pipe. With the above bracket, the light can be

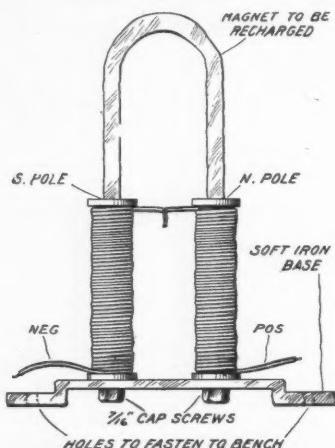


Adjustable Holder for Supporting Bench Light

held in almost any position. It can be raised or lowered to any height simply by lifting, as the weight of the light on the other end will cause the tee to bind on the vertical pipe so that it will not slip. It also can be swung to any angle and the rod slid in or out to vary the position of the light.—Luther T. Engleman, Catasauqua, Pa.

Magneto Magnet Recharger

Take two $1\frac{3}{4}$ -in. square soft iron bars 5 in. long and turn them down to $1\frac{3}{16}$ in. except for a flange on each end about $5\frac{1}{16}$ in. wide, drill and tap a hole in one end of each for 7-16 in. cap screws to fasten the cores to the base plate (which should be of soft iron). Wind $2\frac{1}{2}$ lb. of No. 16 magnet wire on each core. In connecting the coils together care should be taken to have



Homemade Electro-Magnet for Recharging Magneto Permanent Magnets

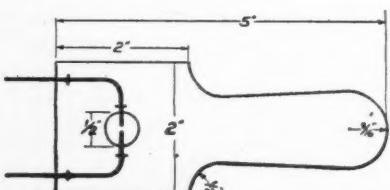
one north and one south pole on top or the current should go around one core in one direction and around the other end in the opposite direction.

The current can be taken from a motor-generator set or any storage battery charging outfit, as nearly all garages are now equipped with them. In recharging a magnet hold it above the recharger (with current turned on) and if the polarity is right it will pull straight down, if not right it will pull sideways and the magnet should be turned around. Rub the magnet on the cores for about a minute.—R. E. Smith, Steele, N. D.

Insulated Spark-Plug Tester

Testing for a missing cylinder in an automobile engine, as it is usually done by shorting the plugs with a screw driver, often results in the motorist receiving a shock. To eliminate this danger a tester may be used.

A simple and easily constructed spark plug tester can be made as follows: Cut a piece of wood 5 in. long and 2 in. wide



Wooden-Handled Spark-Plug Testing Device

from $\frac{1}{4}$ -in. stock. Drill a $\frac{1}{2}$ -in. hole in the center, 1 in. from the end. Shape the other end as a handle as shown in the sketch. Two wires, each $\frac{3}{4}$ in. long, will serve as conductors. Make a right angle bend in the wires $\frac{3}{4}$ in. from one end. Then fasten them to the handle by small staples so that the bent ends are at the

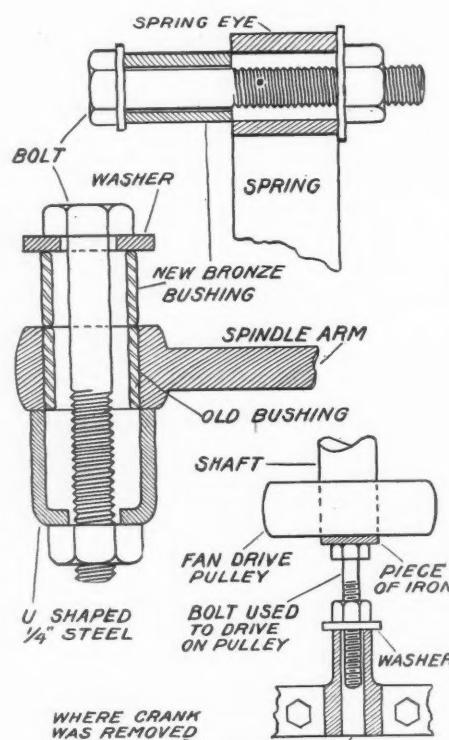
center of the hole. Adjust the wires so that the gap between their ends is about $1\frac{1}{32}$ in.

To test a plug, this device is held by the end, which is shaped as a handle, and one wire is placed on the base of the plug or engine and the other on the top of the plug. If no spark occurs at the gap the points of the plug are together or the current does not reach the plug. If a good spark is obtained, and no difference in the running of the motor is noticed, the plug is shorted and should be cleaned or replaced. If the engine slows down when the spark is obtained the plug is doing its work properly and the miss is in another cylinder.—S. E. Gibbs, Iowa City, Ia.

Handy Uses for Machine Bolts

The illustrations show some uses that machine bolts can be put to in the shop. At the top is indicated a way of driving a bronze bushing in the end of a car spring. This same method may be used to drive the bronze bushings into the spindle arms on Ford cars.

At the middle is shown how to drive out the old bushing with a new one on a spin-



Machine Bolts as Small Screw Jacks for Assembling Parts With Driving Fits

idle arm. The new bushing is pushed into place at the same time driving out the old bushing. A U-shaped piece of steel is used to allow the old bushing to be driven out, otherwise this is the same process as the first mentioned.

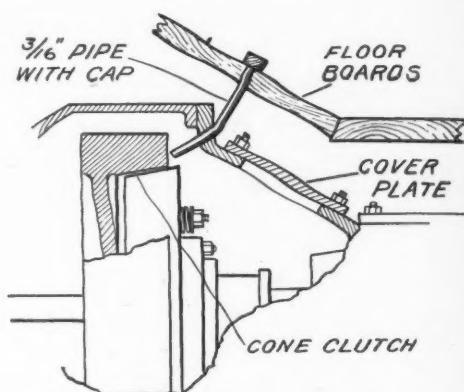
The bottom illustration shows a way of driving the fan pulley on the crankshaft of a Ford car. The starting crank was removed and the old fan pulley was removed without difficulty, but when I tried to drive on a new pulley I had trouble. I placed a bolt with the threaded end in the hole where the starting crank had been removed,

first screwing a nut on as far as it would go and then putting on a washer for the nut to bear against. I then placed the new pulley in position with a bar of iron across its bore for the bolt head to rest against. Then by holding the bolt head with one wrench and tightening the nut with another, the pulley was driven into place.—Hastings Bros., Brookville, Ind.

Cone-Clutch Leather Oiler

The following suggestion is for operators of cars equipped with a leather-faced cone clutch enclosed in the housing between the engine and the transmission in the usual type of unit construction.

To keep a clutch leather in good condition, it should receive frequent applications of neatfoot oil or kerosene. To apply either of these to the usual clutch, it is necessary to remove the floor board and the small hand plate on the housing over the



Device for Applying Treatment to Clutch Facing Without Removing Floor Boards

clutch. This is not such a dirty job, but the fact that it is a job usually prevents the clutch from receiving its deserved attention.

A remedy for this is to drill the housing near the hand plate opening for a 3-16-in. pipe. Have one end of the pipe where it will discharge just over the clutch leather as shown in the sketch and let the other end project through the floor board, preferably about $\frac{1}{2}$ in. and fit it with a spring or screw cap. The pipe may be fastened to the case either by spot welding or by a nut on each side.

With this device, all that is necessary to keep the clutch leather in good condition is to remove the cap once every two weeks or so and inject kerosene into the pipe, at the same time letting in and throwing out the clutch.—H. C. Lewis, Philadelphia, Pa.

The British-Canadian Recruiting Mission want men for the Royal Flying Corps and Mechanical Transport service. They want men of English birth or subjects of Great Britain to communicate with them in reference to this service, either to their central office at 56 W. Adams Street, Chicago, Ill., or to any of their offices which are located in every large city in the United States.

CHILTON TRACTOR JOURNAL

Society of Automotive Engineers' Tractor Meeting

By CHESTER S. RICKER

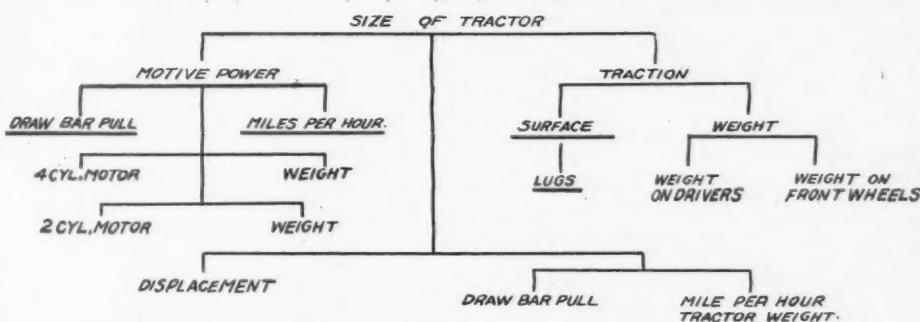
ON February 1, the Society of Automotive Engineers held a Tractor Meeting at the Sherman Hotel in Chicago in connection with the great War Dinner of the Society, which was held in the evening at the New Morrison Hotel. There were four papers presented by the members of the Society connected with the tractor division. The first paper was on "Tractor Service," by George Carmack; the second on "Fundamentals of Tractor Design," by George Strite, and the last two, which were accompanied by lantern slides, on "Tractor Engine Design" and "Tractor Transmission Design," by H. C. Buffington and R. E. Greer, respectively. President H. F. Kettering of the Society presided at the afternoon meeting and while he was not scheduled to present a paper, he injected many new thoughts into the meeting and in such a manner that almost every one commented on the way in which he clarified some of the more obscure points brought out in some of the papers.

Tractor Service Discussed

The keynote of Mr. Carmack's paper was that Tractor Service must start at home—not on the field. He emphasized the uselessness of trying to rebuild a poorly designed tractor in the field and also

the danger of the salesman's version of "service" when selling to a customer. However, he suggested that the service should start in the Engineering Department, where the defects in design can be corrected on paper, next in the manufacturing

slowly by the S. A. E. In reference to the service necessary, it was said that the average 4-plow or smaller machine as now built would scarcely last through more than one year of hard work, and that there were but a very few that would last as much as



What George Strite Considers the Essentials in Tractor Design

department, and, finally, the sales department should educate the farmer as to what he should expect in the way of service. The necessity of accessibility not to the parts that "might need, as the advertisements say," but to those that "must have" attention, was emphasized. Together with this there is the necessity of having as great a standardization of tractor parts as possible. This he felt was being done

five years. He advocated not only the making of parts accessible, but the better protection of all parts.

Much of the service trouble that is encountered, he explained, was laid upon the farmer, but it was not all his fault. Too many of the machines are built to a price and not up to a quality standard. Next, the farmer is sold a 3-plow machine that the salesman says will sometimes carry four plows. The result is that the farmer immediately hitches it up to four plows. Dealers and salesmen should be properly instructed and a salesman should not be made to do service work. It takes away his optimism and if he fails to have the proper experience in repair work, is liable to leave the farmer in worse mood than when he came.

In summarizing the paper which Mr. Carmack had given, President Kettering said that in the tractor business as he saw it, there were two essentials, 50 per cent farmer psychology and 50 per cent machine. Until someone hit upon the proper solution of the first element the second one would be valueless. Without the careful consideration of both elements he felt that a receiver might just as well be called at once and end the misery.

The paper on "Tractor Design," which Mr. George Strite read, was accompanied by two charts that brought out the funda-

	H.P.	Drawbar Pull	PLOWS	CYLINDERS	CYLINDER DIAMETER	R. P. M.	Displacement in Cubic Inches	Displacement per Minute	Displacement per Plow	Displacement per 100 lbs. Drawbar Pull	Displacement per Drawbar Horse Power	Piston Travel Feet Per Minute	Weight of Entire Tractor	Weight per Plow	Weight per Horse Power	Weight per 100 lbs. Drawbar Pull
A ₁ ...	38-60	6000	8	2	10x15	500	2356	1,178,000	147,250	19,633	31,000	1250	20,100	2512	529	335
A ₂ ...	30-60	6000	8	4	6½x8	650	1061	689,650	86,206	11,494	22,988	866	10,500	2437	650	325
A ₃ ...	30-60	5600	8	2	10x12	375	1894	706,500	88,312	12,616	23,550	750	26,000	3250	866	464
		5866							107,250	14,581	25,846	955	21,866	2733	681	374
B ₁ ...	12-20	2250	3	4	4½x5	800	318	254,400	84,800	11,563	21,200	666	6500	2166	542	295
B ₂ ...	18-36	3300	3	4	4½x6½	850	429	364,650	91,162	11,050	20,258	5900	1475	327	178	
B ₃ ...	12-25	2500	3	4	4½x5½	900	312	280,800	93,600	11,232	33,400	825	5200	1733	433	208
B ₄ ...	15-30	2600	3	4	4½x5¾	900	322	289,800	96,600	11,146	19,320	862	3000	1000	200	115
		2661							91,450	11,247	23,544	827	5150	1593	375	199
C ₁ ...	12-24	2200	3	2	6x7	750	395	296,250	98,750	13,465	24,687	875	5000	1666	416	227
C ₂ ...	12-24	2000	3	2	5½x7	750	332	249,000	83,000	12,450	20,750	875	5000	1666	416	250
C ₃ ...	12-25	2500	3-4	2	6½x7	570	464	264,480	75,565	10,579	20,040	665	7400	2114	616	296
		2233							85,771	12,164	22,728	802	5800	1815	482	257

Tabulation of the Salient Features in Three Representative Types of Tractors

A, B and C are the types, and the accompanying numbers, the classes of each type

mentals in a manner that was very lucid. The first of these shows the elements, as they may be considered, and the second one a tabulation, giving the essentials of three different representative types of tractors—the old heavy type, the new 4-cylinder type, and the new 2-cylinder models. They are designated as A, B and C in the numbers representing the different classes.

Some of the things which he advocated in his paper were the proper method of rating tractors and the speed at which they should be run. He was for 2 1-3 m.p.h. as the standard speed for plowing. The speed and the power are factors which must be considered jointly and one of the prime faults with the rating of tractors up to now and which deserved consideration from the society was this method of rating. He felt that we should have a standard speed and rate the power at this speed.

The question of a standard tractor came up and it was explained why the society

had not done anything on this, although such action might have seemed wise. Harry L. Horning pointed out that there was not over 5 to 7 per cent of the possible field for tractors now taken or supplied and that until there were more in use it would be unwise to place any limitations on this potential industry. On the other hand the standardization of component parts was a very proper and non-restrictive step.

Mr. Dacey, of the Buda Co., said that too many of the tractors were without a governor and were running their motors at excessive speeds when overloaded. Much of the trouble experienced was due to this, it was said.

The two final papers merely reviewed the practice that had been found most desirable in the design of motors and transmissions. In the former the cylinder head that was detachable was advocated because it permitted the use of variable compres-

sion. The writer of the paper was also opposed to circulating lubricating systems when kerosene was used. He advocated the individual leads to each part to be oiled.

On the "transmission" paper the requirements for an ideal transmission were summarized and a symposium of standard practice also prepared. The best practice was said to be anti-friction bearings all around, enclosed drive and complete lubrication, belt pulley running as near engine speed as possible and a differential lock. Mr. Greer suggested front wheel drive as ideal but rather difficult to obtain. No standard transmission could be used because gear ratios varied from 30 to 1 to as high as 100 to 1.

Such were the suggestions and solutions to tractor problems which occupied the attention of the S. A. E. members at the tractor meeting.

Tractors for Ohio Farms

At a conference held recently at the Ohio statehouse at Columbus, between Governor Cox, Secretary of Agriculture Shaw and tractor manufacturers from several states, plans were outlined by which it is hoped to have 1500 tractors in operation on Ohio farms in the summer of 1918. The chief difficulty is that of financing the movement. Since tractors cost, on an average, \$2000 each, it will be necessary to extend to farmers credit aggregating \$2,000,000 to \$2,500,000. The governor suggested that this could be accomplished by enlisting the large state and national banks and the federal reserve banks, if necessary, in the tractor business, and securing through them an agreement to take farmers' notes. A committee composed of the governor; Foster B. Houston, farmer and banker at South Charleston; D. C. Wills, of the federal reserve bank, and State Superintendent Berg was appointed to work out the problem. A tractor production committee, headed by L. H. Lightcap, Columbus representative of the International Harvester Co., was appointed and manufacturers will start production at once. Another measure considered at the meeting was that of opening a tractor school for farmers at Columbus, under the direction of the agricultural extension department of Ohio State University. Every tractor representative present volunteered to send a tractor to Columbus for demonstration purposes at the school.

Case Tractor Schools Reported Successful

Service is the keynote which characterizes the policies of the J. I. Case Threshing Machine Co., of Racine, Wis., in its tractor school activities. Tractor schools were established throughout the country by this company, with the idea of its being of assistance to its fellow-workers.

The schools are said to be well attended and are entirely free. Any farmer who is interested in power farming is invited to attend, whether he is a Case tractor owner

or not. The schools are conducted along lines which are designed to give practical and valuable instruction in power farming and tractor operation. Part of the time is given over to lectures and regular classroom work. The other time is devoted to practical work. Tractors are provided, which the students are allowed to dismantle, study, reassemble and put back in running order. Competent instructors from the factory are on hand to give advice and suggestions. Men from the magneto and carburetor factories are also on hand to explain and demonstrate these devices.

The feature of open discussions, to which a considerable amount of time is given over, is said to prove most helpful. It is at these informal discussions that the cure for many heretofore troublesome problems has been found. The Case company conducts about twenty of these tractor schools throughout the winter when the farmer is not so busy and can find time for study.

Tractors to be Purchased for Pennsylvania Farmers

The Food Commission is planning the purchase of two hundred farm tractors for distribution to farmers throughout Pennsylvania, so that they may provide a means of keeping up a maximum production. This was announced on January 30 at the 6th annual convention of the Eastern Implement and Vehicle Dealers' Association by Frank Supplee, of the State Food Commissioner's office.

It is predicted that the crop yield of this state for 1918 will be but 70 per cent of normal. This prediction is based on statistics that were compiled by the Food Commission. The distribution of tractors will help to overcome this predicted shortage and make up for a part of the paucity in manpower.

"The two hundred tractors will be sent where they are most needed to increase the crops and to make up for shortage in man and horse power in producing food crops to feed the world," Mr. Supplee said.

France Will Have Tractors for Spring Plowing

Following a suggestion of Henry Morgenthau, former American ambassador to Turkey, and with the approval of the Food Administrator, the United States Food Administration will ship 1500 farm tractors to France. The first hundred are already on the way, and the whole number will be in France in time for the spring plowing. Through the efforts of Assistant Secretary of the Navy Franklin Roosevelt and Paymaster General McGowan, deck space was provided for the first shipment of tractors aboard a naval transport. Henry Morgenthau, Jr., has been designated by the Food Administrator to follow the machines to France and put them in operation. He plans to organize schools of instruction for French operators and will assist the French minister in distributing the tractors and operating them economically. These machines are expected to give valuable aid in increasing the production of foodstuffs, particularly wheat and potatoes, and to lighten the burden of toil on the old men, women and children. Besides these services, they will release added tonnage for the Allies and American troops, by decreasing the amount of food that must be shipped from America.

Crawler-Type Tractors to be Tried in Cochin China

(Consul Horace Remillard, Saigon, French Indo-China)

The French Government of Cochin, China, has become interested in the employment of tractors of the crawler type for the cultivation of rice. On September 29, 1917, a 45-h.p. track machine valued at more than \$5000 United States currency, was purchased telegraphically. If the experiment is successful, larger orders will follow. Everything depends upon whether the tractor can operate in the soft, rice-paddy fields of Cochin, China.

Correct Lubrication Vital in Tractor Operation*

By PAUL FRANCIS IRVING

TWO North Dakota farmers recently purchased a 30-60 hp. tractor engine of prominent make. Their machine is an excellent one and the tractor farmers are satisfied with their purchase. When they bought their tractor they knew little about the importance of correct lubrication, and less about lubricating oils and therefore relied on their local dealer as to what oil to use. He sold them an oil which he said was "good." It was to a certain extent.

However, on the advice of a lubrication engineer, they later tried an oil costing nearly twice as much per gallon as they previously used. To their astonishment the tractor owners found that the use of the more expensive oil resulted in a fuel saving of 20 per cent and an oil saving of 62.5 per cent. This meant a big money saving per acre plowed.

At Owatana, Minn., an owner of a Little Giant tractor found under competitive tests that by using a different grade of oil from what he had formerly bought he was able to cut his gasoline consumption 27.1 per cent and his oil consumption 84.8 per cent. Another big money saving per acre. The experiences of these tractor owners are common with many tractor farmers. What do they mean?

Simply this: that there is a difference between "oil" and proper lubrication. Correct lubrication means lower cost per acre, and per year, in operating expense. What is it that makes these economies possible?

Here are some of the reasons.

The tractor is a heavy, hard-working, slow-moving machine. It is subjected to rough usage and great strain, due to the character of the ground over which it must travel, in some cases to the absence of springs. Due to the slow speed at which it travels, it does not have the additional cooling value of air circulation, such as is produced by a fast moving automobile. The tractor tends to run hot and demands a lubricant rich in quality to stand up under excessive heat and strain. The oil used must be correct in body for the engine for which it is intended. Otherwise it will fail to reach all bearing surfaces and supply these surfaces with a protecting film.

Correct Body of Oil Necessary

When you consider that the film of oil between the moving metal surfaces is little more than 3-1000ths of an inch thick, and that this oil film makes engine speed possible, you will readily appreciate the vital importance of correct lubrication to the efficient operation of a tractor.

Without that film of oil between pistons and cylinder walls, the pistons, even at low speeds, would bind and seize in a short time, resulting in scored cylinder walls, scored pistons and broken piston rings. These are the penalties that the tractor farmer invites by using an oil of poor quality. If the body of the oil is incorrect

the same penalties may follow even though the quality of the oil be of the best.

Consider the problem of the cylinder temperatures. It is hard to imagine a temperature of from 2500 to 3000 deg. Fahrenheit, which is the approximate heat at the point of explosion. If this heat were permitted to continue unchecked, the cylinders would soon become red hot and the pistons would seize. The chief elements in protecting the engine against this heat are the cooling and lubricating systems. The destructive heat of friction must also be overcome. This task falls to the lubricant. If the lubricant breaks down under heat it loses its lubricating properties and does not separate the moving metal surfaces. Friction follows, producing additional heat. Upon the lubricant falls the additional task of sealing the spaces between pistons, piston rings and cylinder walls. In doing this part of the oil is directly subjected to high temperatures. If it fails to stand up under this heat, the lubricating film is destroyed and compression is weakened. Gas escapes past the piston rings. The force of the explosion is reduced. Power loss and excessive fuel and oil consumption result. The oil which meets the needs of a tractor with scientific exactness will stand the heat of service, prevent undue frictional heat and result in full compression and power.

Bearing Lubrication is Vital

A great deal of heat is generated by metal-to-metal contact of the crankshaft and bearing when the flywheel is revolving at the rate of 900 to 1250 r.p.m. Bearings differ widely in size and shape and different methods of lubrication are employed, according to the oil system of the engine.

The use of an incorrect oil—that is, an oil of poor quality or incorrect body—may result in worn main or connecting-rod bearings, piston rings, crankshaft or crank pins.

How is the correct grade of oil for a tractor determined?

There are a number of factors which must be considered, one of which is the lubrication system employed in the tractor. Lubrication engineers have classified these systems into five main heads. The oil for a given tractor should be suited to the system employed in that tractor.

For example, if the tractor has a full force feed lubrication system, oil is supplied by direct pressure to the main friction points, including wrist pins. This system permits the use of a heavy oil, rich in lubricating quality.

If the tractor has a lubricating system in which the oil pipes are exposed to atmospheric temperatures, the cold test qualities of the lubricant must also be taken into account. The oil must be adapted to the lubricating system of the tractor in which it is used.

There are other factors which enter into the selection of the correct oil. These are: Construction of the engine, horizontal, vertical or V-type cylinder arrangement; two

or four-stroke cycle; bore and stroke; valve construction, size and location; number and fit of piston rings; piston design and composition; piston clearance; water-cooling system (air or thermosyphon), engine speed and climatic conditions. All of these must be considered and the oil used must meet these conditions with scientific exactness.

To determine the correct oil for any tractor then requires a technical knowledge of lubricants and their properties and an exhaustive knowledge of gas engine construction and operation, combined with broad practical experience. The tractor owner cannot be expected to have such knowledge and experience. How then can he cope with the problem of proper lubrication?

The answer is this. Make the dealer or salesman show you the recommendation of a reliable lubricant manufacturer, that the grade of oil the manufacturer recommends meets the lubricating requirements of your type of tractor with scientific exactness. Be sure of the manufacturer's standing in the lubrication field—that he is qualified to make the recommendation. Have it proved to your satisfaction, by actual demonstration, that this oil will give maximum lubricating efficiency and lowest maintenance cost. Making an oil test is not the most satisfactory method. An actual service test of the oil used in the crankcase of your engine or other tractor engines of similar make and model is the safest guide.

In many cases the tractor manufacturer, either in his instruction book or by means of a plate attached to the engine, recommends the use of a certain brand or grade of oil. In such instances it is advisable to follow the tractor manufacturer's advice. The tractor manufacturer wants his tractors to make good. He wants the purchaser to get the maximum of service from them.

In buying lubricating oil do not be guided by price. As shown by the experiences at the beginning of this article, pennies saved in buying lubricating oil may jeopardize dollars. And they lead to heavy fuel bills, permanent engine wear and loss of time and money.

Follow Tractor Makers' Advice

The saving between the cost of poor lubricating oil and the best lubricating oil is small. It is not worth while. It may mean the difference between a smooth running tractor season, free from repairs, or it may mean a season of constant breakdowns and replacing of broken parts.

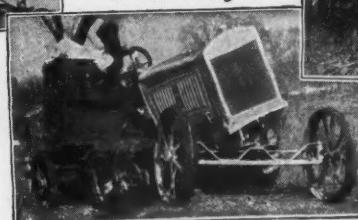
If he starts the season with a wrong-bodied oil or a poor quality oil, the tractor owner is likely to finish the year with his tractor in the repair shop, seriously reduced in value, reduced in working efficiency and in serviceability. With incorrect lubrication the tractor is constantly laboring under a load it was never intended to bear. Poor lubrication results in wasted energy, added fuel, oil and repair expense. The repair shop is no place for a tractor in these days.

* Data furnished by the Vacuum Oil Co., Rochester, N. Y.

A Tractor Of Highest Efficiency

Pulls three 14-inch plows with ease and steers itself while so doing.

Note the unusual flexibility.



In discing, it does not pack the ground—yet pulls a big load.



The Model D Bates Steel Mule is the result of six years' experience in building the most efficient 3-plow tractor made. It is based on the mechanical principles that have made the Bates Steel Mule a popular favorite on America's farms as well as on foreign soil.

The Model D is light but has a pull far in excess of the usual tractors in its class. This is due to three things—efficient valve-in-head motor, roller bearing transmission and crawler grip on the ground.

The Bates Steel Mule

FULLY PROTECTED BY PATENTS

REG'D U. S. PAT. OFF.

The Model D is propelled by two carefully made powerful crawlers. Has twelve ground-gripping cleats on each side—twenty-four claws always clinging to their footing. There's no slip there—no power wasted in back-slipping. Every ounce of power delivered to the crawlers means just so much strong, steady pull on the drawbar.

The motor is a distinct tractor type, heavy duty, four cylinder, valve-in-head, and is especially designed for burning kerosene, distillate, or other low grade fuels as low as 38° Baume test.

Pulls three plows at a speed of $2\frac{1}{4}$ to $3\frac{1}{2}$ miles per hour, and does it under very unfavorable footing conditions. Has nickel steel roller bearings throughout, and all working parts are totally encased against dust.

Its exceptional flexibility enables the operator to ride over any uneven ground comfortably. This flexibility also protects the tractor from any internal strains when working on rough plowed ground, a feature which not only assures longer life to the tractor but also contributes to its high efficiency because its bearings are always running in perfect alignment.

The front wheels are so placed that the machine steers itself when plowing by following the furrow wall.

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Has heavy duty 4-cylinder valve-in-head motor, specially designed for use of kerosene.

